Appendix I

ENVIRONMENTAL JUSTICE

May, 2001

2001 RTP Technical Appendix

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Environmental Justice

I.   Introduction

The public expects government agencies to execute programs and administer federal funds fairly. The law requires it, as stated in Title VI of the Civil Rights Act of 1964, which says that "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

As a government agency that receives federal funding, SCAG is responsible for implementing Title VI and conforming to federal environmental justice principles, policies, and regulations. SCAG is proud of its longstanding policy to actively ensure nondiscrimination in all of its activities. Furthermore, it is SCAG's continuing practice to identify and prevent discriminatory effects by actively administering its programs, policies, and activities to ensure that social impacts to communities and people are recognized early and continually throughout the transportation decision-making process – from early planning through implementation.

In the 1990's, the federal executive branch issued orders on environmental justice that amplified Title VI, in part by providing protections on the basis of income as well as race. These included President Clinton's Executive Order 12898 (1994), a U.S. Department of Transportation order (1997), and a Federal Highway Administration order (1998). SCAG is expected to conduct environmental justice analyses, as well as public outreach, to comply with these orders and with federal planning regulations.

Under these Department of Transportation regulations, SCAG is the designated Metropolitan Planning Organization (MPO) for a six-county region, including the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. As an MPO, SCAG must produce a long-term regional transportation plan every three years.

The transportation projects that comprise SCAG's plans and programs have benefits and burdens. The adoption of plans involves tradeoffs between these benefits and burdens. SCAG uses the environmental justice analyses described in detail in this appendix to help its elected officials make these decisions fairly. The analyses are designed to assure that benefits and burdens are not distributed unfairly across populations in the region. However, the goal of federal environmental justice policy is not to guarantee entitlements but rather to prevent discriminatory effects.

The SCAG region is uniquely large – about the size of Kentucky – with geographically dispersed commercial and residential centers. The region includes heavily urban and entirely rural areas, as well as terrain features that make air quality goals difficult to

achieve. Demographically, it is one of the most diverse regions in the country, already becoming the first to experience a white minority, and encompassing the extremes in household income. Furthermore, it is projected to continue to experience dramatic population growth, adding over 6 million people by 2025.

Federal environmental justice guidance documents direct SCAG to analyze impacts on "minority" populations, and define "minority" specifically to mean all ethnic and racial groups other than white. SCAG's demographic projections for the 2001 Regional Transportation Plan (see Table I.1) show that population growth in the SCAG region will come almost exclusively from two minority groups — Latinos and Asian/Pacific Islanders. Viewed another way, minorities will account for nearly all of the region's population growth through the year 2025.

Table I.1

Projected Demographic Changes in the SCAG Region, 1997 - 2025				
Region*	**1997**		**2025**	
Total Population	16,054,496	-	22,460,126	-
Total Households	5,175,320	-	7,360,847	-
White	7,030,242	43.8%	6,421,093	28.6%
African-American	1,250,745	7.8%	1,343,848	6.0%
Native American	61,129	0.38%	77,850	0.35%
Asian/Pac. Islander	1,636,879	10.2%	2,937,648	13.1%
Other	32,384	0.20%	44,089	0.20%
Latino	6,043,117	37.6%	11,635,598	51.8%
Non-white	9,024,254	56.2%	16,039,033	71.4%
Over 65	1,573,155	9.8%	3,447,436	15.3%
Disabled	1,127,364	7.0%	1,614,292	7.2%
Below Poverty**	629,196	12.2%	926,144	12.6%
Below 1.5 x Poverty	386,690	7.5%	570,586	7.8%
Below 2 x Poverty	397,608	7.7%	577,124	7.8%
Income Quintile 1***	1,031,141	20%	1,488,920	20%
Quintile 2	1,034,449	20%	1,476,216	20%
Quintile 3	1,035,055	20%	1,469,096	20%
Quintile 4	1,035,723	20%	1,465,619	20%
Quintile 5	1,038,953	20%	1,460,997	20%

* Regional totals are the sum of estimates for Imperial County and SCAG's transportation modeling area, which covers most of the land area in the other five SCAG counties. Less than 1% of the region's population is not captured by these numbers.
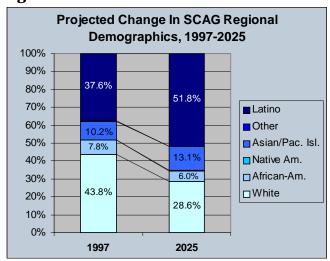
** Based on household income as reported in 1990 Census. Poverty level is $10,600 for a household of 3 persons, as defined by U.S. Department of Health & Human Services (as required by Federal environmental justice guidance documents).

*** Based on household income as reported in 1990 Census. The income quintiles are defined as follows, based on 1990 U.S. Census household income data: Quintile 1: Below $15,949; Quintile 2: $15,950 - $29,730; Quintile 3: $29,731 - $44,744; Quintile 4: $44,745 - $68,399; Quintile 5: $68,400 and up. By definition, one-fifth of households fall into each quintile.

Environmental justice guidance documents also say that "minority populations should be identified where either…the minority population of the affected area exceeds 50 percent or [where] the minority population percentage of the affected area is meaningfully greater

than the minority population percentage in the general population or other appropriate unit of geographic analysis."[1]   These analyses assume that the SCAG region is the appropriate unit of comparison for geographic analysis. Since the region as a whole exceeds 50% minority population even today (see Figure I.1), SCAG addresses this guidance requirement simply by conducting analysis of the impacts on all ethnic groups. In this way, impacts can be compared for all groups no matter what their representation in the region.   In its environmental impact analyses (discussed in Section IV of this Appendix), SCAG uses the "meaningfully greater" criterion for all of the listed demographic categories, even though it is not specific.

Figure I.1

Projected Change In SCAG Regional Demographics, 1997-2025

	1997	2025
Latino	37.6%	51.8%
Other	10.2%	13.1%
Asian/Pac. Isl.	7.8%	6.0%
African-Am.	43.8%	28.6%
White		

In another significant trend for environmental justice, the number of persons aged 65 or over in the SCAG region will more than double in the next two decades, growing from about 1.6 million in 1997 to more than 3.4 million by 2025. Thus, travel demand, mode choice, transportation security and safety concerns for the elderly will become more important in the future.

Statistics in Table I.1 also indicate that the percentage of households in poverty will remain approximately constant in the future. This is an assumption by SCAG; it is possible that the distribution of income will change over time. SCAG has also assumed that the distribution of households among the five income quintiles will be the same in 2025 as in the 1990 Census. Past trends in income distribution for SCAG region counties are inconclusive.   They generally show that, in constant dollars (i.e., disregarding inflation), median household income is quite steady over time. However, other analyses have suggested that those in the top 25% of household income are gaining in earning power, while those in the middle 50% are declining somewhat and the lowest 25% are holding steady. Given the inconclusive nature of these data, SCAG assumed that the income distribution that prevailed in 1990 would be maintained through 2025, for the

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[1] "Environmental Justice Guidance Under the National Environmental Policy Act," White House Council on Environmental Quality, December 10, 1997.

purposes of the analyses conducted here. Data from the 2000 Census were not available in time to be used in SCAG's environmental justice analysis for the 2001 RTP.

Maps showing the locations of the major demographic groups considered in the environmental justice analysis, along with the locations of the major plan investments, are provided at the end of this Technical Appendix. The following maps are provided:

∉# 2025 Non-White Persons per Square Mile

∉# 2025 Low-Income Persons per Square Mile (those in the lowest income quintile)

∉# 2025 Latino (Hispanic) Persons per Square Mile

∉# 2025 Elderly (Over 65) Persons per Square Mile

∉# 2025 Asian/Pacific Islander Persons per Square Mile

∉# 2025 African-American Persons per Square Mile

∉# 2025 Plan Goods Movement Projects with Non-White Persons per Square Mile

∉# 2025 Plan Goods Movement Projects with Low-Income Households per Square Mile

∉# 2025 Plan Maglev Projects with Non-White Persons per Square Mile

∉# 2025 Plan Maglev Projects with Low-Income Households per Square Mile

∉# 2025 Plan Transit Corridor System with Non-White Persons per Square Mile

∉# 2025 Plan Transit Corridor System with Low-Income Households per Square Mile

∉# 2025 Regionally Significant Baseline Projects with Non-White Persons per Square Mile

∉# 2025 Regionally Significant Baseline Projects with Low-Income Households per Square Mile

∉# 2025 Plan Highway and Corridor Projects with Non-White Persons per Square Mile

∉# 2025 Plan Highway and Corridor Projects with Low-Income Households per Square Mile

II.   Distribution of Overall Plan Benefits and Costs

The 1998 Regional Transportation Plan contained a number of analyses designed to assess the equity of the plan for minority and low-income populations in the region. Initial analysis focused on the distribution of overall plan benefits and costs. Benefits were evaluated by calculating plan expenditures for various travel modes, as well as the time savings resulting from the plan. The analysis looked at how these benefits were distributed across different population groups. Costs were evaluated by examining the taxes – sales, gasoline, and income – that fund most transportation expenditures, and how these tax burdens fall on various populations. The underlying concept is that the share of benefits should be roughly in line with the share of costs paid. These analyses are documented in detail in Section 4 of the Technical Appendix to the 1998 Regional Transportation Plan. Portions of them are updated below.

The initial analyses conducted for the 1998 Plan showed that lower-income groups would receive a larger share of plan benefits in the form of plan expenditures. However, plan benefits in the form of time savings would accrue overwhelmingly to high-income groups. This finding was at least partly due to the assumption, supported by the literature, that travel time should be valued as a portion (normally half) of the wage rate. This finding led SCAG to ask whether the apparent inequity was caused entirely by this assumption, or whether the underlying cause was an actual inequity in travel time.

To answer this question, another analysis was conducted to assess the plan's effects on "accessibility," defined as the ease with which desired activities can be reached from any location. In this analysis, travel time was held constant for everyone so that differences could be seen in the extent of opportunities reachable by (or accessible to) various population groups. This analysis showed that the Regional Transportation Plan would result in disproportionate accessibility gains for minority and low-income residents of the region. The accessibility analysis is described in detail and updated in Section III of this Technical Appendix.

The remainder of Section II will describe the benefit and cost distribution analyses in more detail and present the most recent available data (generally, 1997) on tax burdens.[2]

Distribution of Plan Expenditures by Mode

The 2001 Regional Transportation Plan (RTP) will entail expenditures on a variety of modes of travel, including highways, urban rail, commuter rail, and bus. U.S. Census data indicates travel mode choice by income level. This data can be used to assign a portion of the RTP expenditures (by mode) to various income groups. Table I.2 shows the approximate RTP expenditures, including baseline expenditures, by mode (some estimates were made on the allocation of expenditures among modes). Table I.3 shows

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[2] The income categories used for the plan expenditure analysis differ slightly from those used for the remainder of the equity analyses in this appendix and in the RTP itself. However, this difference is not significant to the results of any of the analyses or to the conclusions drawn from them.

mode usage by income category, based on 1990 Census data, the most recent available. (This table was also presented in the Technical Appendix to the 1998 RTP.)

Table I.2

Estimated 2001 RTP Expenditures by Mode (in 1997 $millions)			
Mode	**Public**	**Private**	**Total**
Bus	$50,079	$0	$50,079
HOT/HOV/HOV Connectors*	$2,041	$1,310	$3,351
Commuter/High Speed Rail	$5,435	$16,152	$21,587
Highways/Arterials	$52,574	$2,821	$55,395
Light/Heavy Rail	$14,329	$145	$14,474
Total	$124,458	$20,428	$144,886

* HOT = High-Occupancy Toll; HOV = High-Occupancy Vehicle

Table I.3

Mode Usage by Income Category					
	Household Income				
Mode	Less than $12,000	$12,000 to $24,999	$25,000 to $49,999	$50,000 to $69,999	$70,000 and above
Bus	67.2%	23.5%	8.3%	1.0%	0.0%
Carpool	3.0%	9.0%	47.0%	21.0%	20.0%
Commuter Rail	1.0%	3.0%	21.0%	24.0%	50.0%
Drive Alone	4.0%	20.0%	26.0%	20.0%	30.0%
Urban Rail	47.0%	28.0%	15.0%	9.0%	1.0%

Note: Only rows sum to 100%, since one mode choice is not necessarily exclusive of others.   *Source: 1990 Census*

The data in these two tables were combined to produce the results summarized in Table I.4 and in Figure I.2. This table and figure show that total 2001 RTP expenditures will be distributed somewhat more heavily towards lower-income groups, based on the mode choices indicated by 1990 Census data. However, as shown above, the plan expenditures include substantial private investments in roadways and especially in the high-speed Maglev rail system. When only the public portion of Plan expenditures is considered (see Figure I.3), the distribution is even more heavily weighted towards the lower income categories.

Table I.4

Share of 2001 RTP Expenditures by Income Category					
	Less than $12,000	**$12,000 to $24,999**	**$25,000 to $49,999**	**$50,000 to $69,999**	**$70,000 and above**
Total Expenditures	29.7%	19.3%	18.6%	13.0%	19.5%
Public Portion	34.2%	21.4%	17.7%	11.3%	15.3%
Percentage of Region's Households*	15%	18%	32%	19%	16%

* Based on 1990 Census; assumed to be the same in 2025.

Figure I.2

**Share of 2001 RTP Total Expenditures
by Income Category**
Annual Household Income (1990 Census)

$70,000
and above
20%

Less than
$12,000
29%

$50,000 to
$69,999
13%

$12,000 to
$24,999
19%

$25,000 to
$49,999
19%

Figure I.3

**Share of 2001 RTP Public Expenditures by
Income Category**
Annual Household Income (1990 Census)

$70,000 and
above
15%

Less than
$12,000
34%

$50,000 to
$69,999
11%

$25,000 to
$49,999
18%

$12,000 to
$24,999
21%
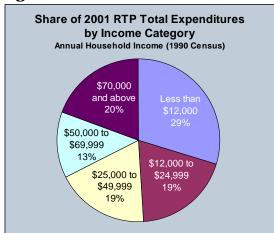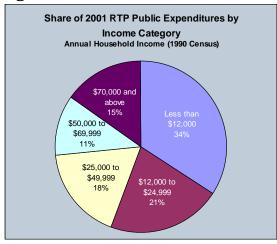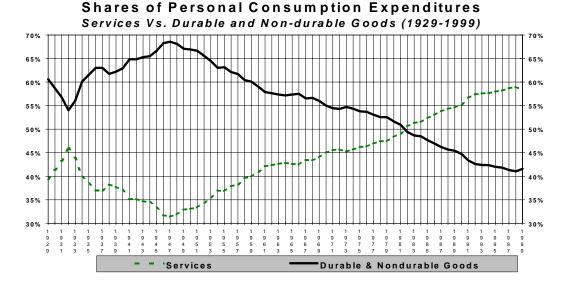
Distribution of Plan Costs (Taxes)

The prior (1998) equity analysis examined in detail the incidence, or distribution of the burden, of taxation. Sales and gasoline taxes, along with a portion of income taxes, are the primary sources of funding for the region's transportation system. That analysis began by demonstrating the long-term shift away from a manufacturing economy and towards a service economy. This continuing trend is demonstrated in Figure I.4.

Figure I.4

Shares of Personal Consumption Expenditures
Services Vs. Durable and Non-durable Goods (1929-1999)
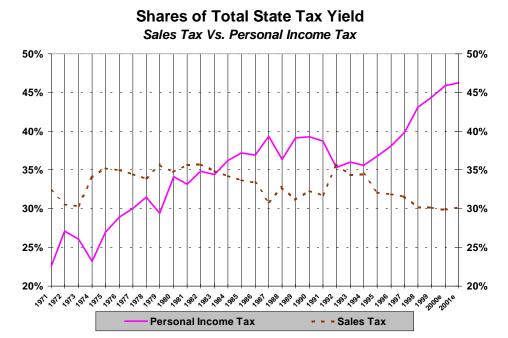
Source: National Income and Product Account (NIPA) historical series, Bureau of Economic Analysis.

This shift implies that the sources of public revenue are changing. Revenues from gasoline taxes may be expected to diminish as gasoline consumption drops with fuel economy advances and increased market penetration of alternative-fuel vehicles. Revenues from sales taxes on durable and non-durable goods will also decline, as these sales constitute less and less of the economy. Figure I.5 shows how the share of state tax income from sales tax continues to decline.

Figure I.5

Shares of Total State Tax Yield
Sales Tax Vs. Personal Income Tax

Source: California Department of Finance, State Board of Equalization and U.S. Bureau of Economic Analysis.

Moreover, the fuel tax (technically, an excise tax) and sales tax that are the foundation of transportation revenue funding inherently raise equity concerns for lower income groups. While sales taxes are, by definition, a percentage of the price of a fairly broad range of taxable goods, excise taxes are imposed on a narrow band of goods. Excise taxes are typically based on volume rather than price, e.g., per gallon, per pack, and so forth. So better-off people pay the same absolute tax on an expensive premium beer, cigars or gasoline as low-income families pay on a generic variety. As a result, excise taxes are the most regressive kind of taxes.[3]

Because graduated tax rates are almost impossible in a sales tax system, sales tax inevitably takes a larger share of income from low- and middle-income families than from high-income families. Thus, while a general sales tax may appear on its face to be a "flat-rate" tax, its practical impact is different. Since the sales tax effectively exempts all un-spent income, and since the rich are able to save a much larger portion of their incomes than middle-income families (while the poor can rarely save at all), the tax is inherently regressive.

Sales and excise taxes are the main regressive element of most state and local tax systems. Spending as a percentage of income falls as income rises, and upper income people tend to spend more on services—which mostly are not taxable.

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[3] In addition to state and federal excise taxes on gasoline, California imposes ordinary sales tax on gasoline consumption.

California's income taxes, by contrast, are the most progressive in the country. As shown in Figure I.6, in 1997 the highest two income quintiles together paid over 96% of the region's total income tax, while earning only 80% of the total Adjusted Gross Income of the region. The highest income quintile alone contributed over 85% of the region's total income tax, while earning only about 61% of gross income. The two lowest income quintiles earn about 10% of the region's total AGI, while contributing a negligible percentage of the region's income tax.

Figures I.7 and I.8 show the incidence, or distribution, of California sales and fuel taxes by income quintile, respectively, for 1997, the most recent year for which data is available. Figure I.9 summarizes the 1997 tax data, showing the total burden of the state's regressive sales and fuel taxes combined with its progressive income tax as a percentage of AGI. The burden of state sales, fuel, and income taxes still falls most heavily on the lowest income group; overall, the burden ranges from a high of 16 percent of AGI for the lowest income group, to a low of about 9 percent for the highest income group.

Figure I.6

Total Income Tax Paid, Percent of AGI and Taxes Paid, and Income Tax Burdens by Income Class - SCAG Region, 1997

Figure I.7
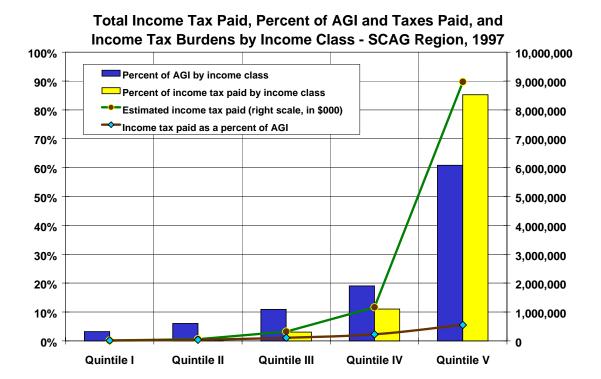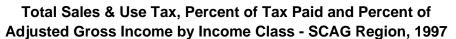
Total Sales & Use Tax, Percent of Tax Paid and Percent of
Adjusted Gross Income by Income Class - SCAG Region, 1997
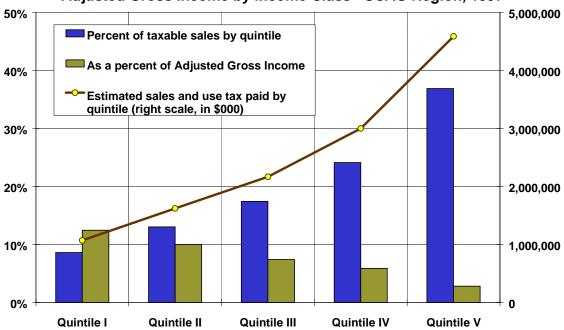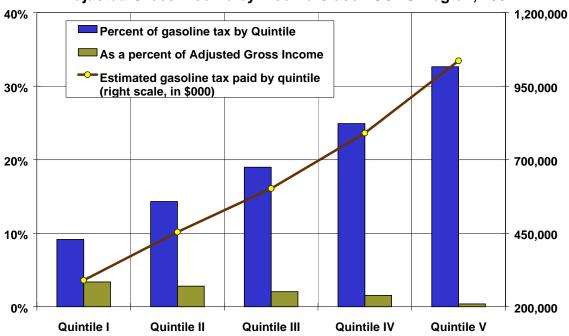
Figure I.8

Total Gasoline Tax, Percent of Tax Paid and Percent of
Adjusted Gross Income by Income Class - SCAG Region, 1997

Figure I.9

Tax Burdens (Taxes as Percent of Adjusted Gross Income)
SCAG Region, 1997

| Income Tax | Sales & Use Tax | Gasoline Tax |

It is important to remember that the tax burdens shown here are actual tax payments for the region as a whole. They are not the specific taxes that will directly fund the projects that comprise the 2001 RTP, though expenditures in the RTP can be expected to be funded at least in part by these taxes.

Distribution of Time Savings

For the 1998 RTP, SCAG calculated the monetary value of the time savings resulting from the plan. As mentioned above, that analysis found that, when time is valued according to wage rate, most of these savings accrue to higher-income groups. Since the distribution of the value of these savings for the 2001 RTP is likely to be similar to that found in the 1998 RTP analysis, this analysis will not be repeated here. Refer to Section 4 of the 1998 RTP Technical Appendix for the results of the prior analysis.

For the 2001 RTP, transportation modeling results were used with data on mode choice by ethnic group and income group to determine travel time savings for these subpopulations. Results were calculated for trips made by automobile, for trips made by low-cost transit (such as bus and urban rail), and for trips involving all types of transit (including higher-priced options such as commuter bus and rail, or future high-speed rail). This distinction is made because the fares and service of some of the region's transit options may not be accessible by low-income riders.
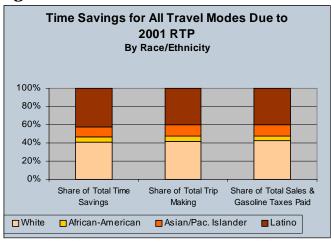
For the plan overall, the share of time savings is generally in line with each group's share of trips made and share of taxes paid. For example, this is shown by Figures I.10a and I.10b, which summarize the results for all modes of RTP investments by income quintile and ethnicity, respectively. Figure I.10a indicates that the share of taxes paid by the highest income quintile would somewhat outweigh that group's share of time savings under the 2001 RTP.

Figure I.10b indicates that the share of total time savings for Asian/Pacific Islanders (approx. 11%) would be slightly less than their share of trip making (approx. 13%) or their share of taxes paid (approx. 12%). This result could be due to the residential location choices of these groups, relative to the planned 2001 RTP investments. Without specific guidelines for evaluating this result, and given the uncertainties in the data being analyzed, it is difficult to say whether this disparity is significant, though it could warrant further study.

Figure I.10a

Figure I.10b

When transit modes are considered separately, there are some differences between the share of time savings and the share of burdens borne (i.e., taxes paid). (Note that the share of total taxes paid is the same in each figure; these tax burdens were not separated by mode.) Figures I.11a and I.11b show the analysis results for low-cost transit modes, such as local bus and urban rail, for the five income groups and the four largest ethnic groups, respectively.

Transit users in the lowest income quintile pay less than 10% of total sales and gasoline taxes collected in the region, but make over 20% of trips by low-cost transit and will enjoy nearly 27% of the time savings realized from the 2001 RTP investments. When the two lowest income quintiles are considered, the share of taxes paid is just over 20%, but the share of benefits is close to 60% (and exceeds the share of trips made). As shown in Figure I.11b, the Latino segment of the region's 2025 population will pay less than 40% of total sales and gasoline taxes, but will receive nearly 50% of the time savings on low-cost transit. The share of time savings for African-American and Asian/Pacific Islander transit users likewise will exceed the share of taxes paid, though for all three minority groups, the share of trips made is projected to be slightly more than the share of time savings.
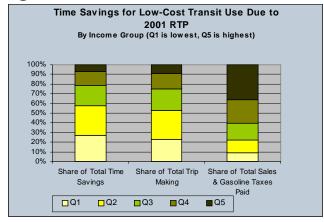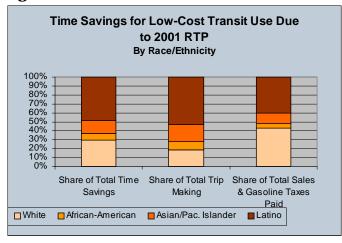
Figure I.11a

Figure I.11b

As might be expected, the time savings for trips making use of higher-cost transit modes are more favorable for higher income groups. As shown in Figure I.12a, the highest income quintiles will receive a greater share of benefits in the form of time savings from these investments, relative to their overall share of tax burden. The share of time savings for the region's largest non-white ethnic groups will be slightly less than their share of trip making by these transit modes, but will still outweigh their respective tax burdens (see Figure I.12b).

Figure I.12a

Time Savings for All Transit Types Due to 2001 RTP
By Income Group (Q1 is lowest, Q5 is highest)

Figure I.12b

Time Savings for All Transit Types Due to 2001 RTP
By Race/Ethnicity
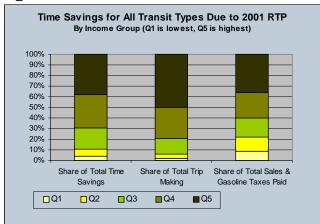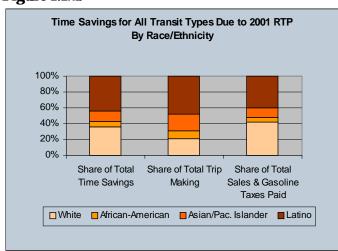
Since the vast majority of the region's trips are made by car, the results of the analysis for automobile use are also important. Like the results for all modes combined, this analysis shows generally comparable shares of time savings, trip making, and tax burden for all income and ethnic groups (see Figures I.13a and I.13b, respectively). The results for Asian/Pacific Islanders are similar to those for all modes combined, although the share of time savings, at about 10%, is again slightly less than their share of trip making (about

13%) and taxes paid (about 12%). Given uncertainties in the analysis, it is not clear whether this is a significant difference: certainly the shares are quite comparable.

Figure I.13a
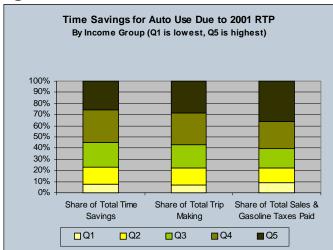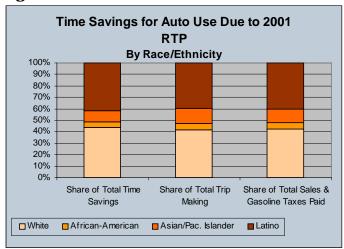
Figure I.13b

To summarize, the foregoing analysis of benefits and burdens of the 2001 RTP generally indicates that benefits (in the form of time savings) are in line with burdens (in the form of taxes paid) for the demographic groups of concern from an environmental justice perspective. The following sections of the technical appendix address the distribution of additional RTP benefits (specifically, accessibility to opportunity) and RTP costs (environmental impacts).

Supporting data for the foregoing analyses are provided at the end of this Technical Appendix.

III.   Accessibility Analysis

One finding of the equity analyses conducted for the 1998 RTP was that the value of time saved as a result of the Plan investments was expected to be much greater for high-income groups than for low-income groups. This was a natural outcome of the assumption that travel time should be valued in proportion to the wage rate, and led to the question: is the inequity in plan benefits due only to this assumption about the value of time, or is it a real inequity in terms of time itself?

To address this question, SCAG designed an analysis of how the RTP improved accessibility: how easily people can reach destinations such as work, school, shopping, or essential services. In this analysis, time was held constant so that any differences could be seen in the accessibility enjoyed by different population groups.

The 1998 RTP Technical Appendix contained an extensive analysis of travel behavior by various segments of the population. Since this work rested on 1990 Census data, it will not be repeated here. The ultimate indication of this work is that travel behavior (perhaps unsurprisingly) is determined primarily by income, not by ethnicity.

However, even in 2025, disparities will persist in the ethnic makeup of the income categories. SCAG's demographic projections for the plan year show that minorities may still be disproportionately represented in the lower income categories (see Figure I.14[4]).

Figure I.14

Projected Distribution of Income and Ethnicity, SCAG Region 2025

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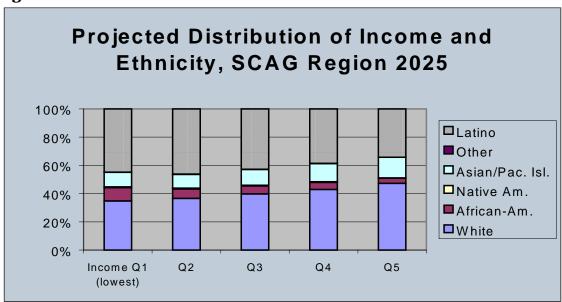
[4] Based on SCAG household count estimates for 2025. The population totals shown in this figure are the sum of estimates for Imperial County, plus the area covered by SCAG's transportation modeling. This sum misses about 161,000 people in portions of the region not covered by the model, or less than one percent of the region's projected 2025 population.

In light of this outlook, efforts to assess equity on the basis of income categories are still important. SCAG's updated accessibility analysis (for both income and ethnic groups) is described below.

Accessibility – A Discussion

The 1998 RTP Technical Appendix contained a discussion of accessibility as a Plan performance measure that is presented in similar form here.

Access or accessibility refers to the opportunity to reach a given destination within reasonable time and costs, or without being impeded by physical, social or economic barriers. Accessibility represents the potential for both social and economic interaction. It is determined by the spatial distribution of potential destinations, the ease of reaching each destination, and the magnitude, quality and character of the activities at the destination sites.

Travel costs are central: the less travel costs in time and money, the more places can be reached within a certain budget and the greater the accessibility. Having a choice of destinations is also crucial: the more destinations, and the more varied the types of destinations, the higher the level of accessibility. Ideally, transportation and land use[5] measures should be combined to ensure minimal travel time and cost.

Accessibility is determined by both patterns of land use and the nature of the transportation system. The concept of accessibility acknowledges that the demand for travel is derived from the demand for activities.

In contrast, mobility is the ability to travel and the potential for movement. It reflects the spatial structure of the transportation network and the level and quality of its service. Mobility is determined by such characteristics as road capacity and designed speed and, in the case of automobile mobility, by how many other people are using the roads.

As a planning goal, accessibility has two crucial advantages over mobility. First, it allows for evaluation of trade-offs between land use and transportation policies and focuses attention on the level-of-service of the metropolitan system as a whole, rather than just the transportation system. Policies designed to increase the mixing of land uses can be compared to policies designed to increase the capacity of an intersection, for example, by answering the question: what effect does each have on accessibility?

Second, accessibility as a planning goal provides clear direction for policy makers. While increased mobility may be a good thing, higher levels of accessibility are inherently a good thing.

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[5] The analysis discusses land use only in relationship to accessibility in general. The focus is on how transportation improvements can increase accessibility to activities and opportunities within a reasonable time of travel by transit and by auto.

If our goal changes, then the measures by which we monitor our progress must change as well. Because mobility has been so central to transportation planners, they almost universally use performance measures that reflect the ease with which vehicles can get through the transportation system — measures like freeway and intersection level-of-service, or volume-to-capacity ratios, or vehicle-miles-traveled. If the goal is accessibility, then one must start to develop new measures that reflect the spatial distribution of activities and the ease of travel between them.

If we start thinking about accessibility rather than mobility, we will begin to envision all kinds of new possibilities, new approaches and new solutions. Instead of fighting endless conflicts between maintaining mobility and controlling the negative effects of transportation, we can move on to constructive discussion of alternatives that enhance accessibility while protecting the environment and improving the quality of life in our communities.

How can increases in accessibility be measured? There are several possible ways: actual use of the transportation system by different segments of the population[6]; the spatial distribution of activities and the "ease" of travel between them; opportunities available within a given time range — to show people how many jobs or shopping opportunities are available within a thirty minute walk, transit trip or drive from their homes; and finally, the physical access to the transportation system.[7]

Accessibility Analysis and Results

The accessibility measure chosen for the balance of this analysis is similar to the third one described above: what percentage of work or service opportunities are reachable within a given time range. In this case, SCAG analyzed the percentage of retail jobs and service jobs accessible within 30 minutes by auto, or within 45 minutes by transit. The locations of service jobs should generally be indicative of the locations of essential services, such as banking, health services, auto repair, police and fire protection, and social services.

The analysis further examined accessibility by any transit regardless of cost, or only by low-cost transit such as bus and urban rail. This distinction is made because the fares and service of some of the region's commuter rail may not be accessible by low-income riders. The following sections describe the methodology used to calculate the accessibility results.

Socioeconomic and transportation data are all held at the transportation analysis zone (TAZ) level, which is consistent with the analysis unit used by SCAG staff. Currently, there are 3,191 TAZ's in the SCAG region modeling area.

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[6] "Equity in Transportation Investment," by Hank Ditmar and Don Chen, Surface Transportation Policy Project (STPP), background papers presented at the conference on Transportation: Environmental Justice and Social Equity, Sponsored by Federal Transit Administration (FTA) and Surface Transportation Policy Project, held in Chicago, November 1994.

[7] Requirements under the Americans with Disabilities Act are not covered by this analysis.

Socioeconomic data used in this analysis include the income quintiles and ethnic groups described in Section I of this Appendix, based on 1990 Census data. These counts are disaggregated to the TAZ level. The Forecasting Division staff forecast the numbers of total jobs, retail jobs, and service jobs in each county for 2025. These estimates are disaggregated to the TAZ level.

The transportation modeling data are prepared for both 2025 baseline and 2025 plan. The ratio of trip-making rate by income and by mode (auto and transit) is calculated at the county level based on Public Use Microdata Samples from the U.S. 1990 Census. This ratio is applied to all TAZ's within the county on the assumption that trip making rates are the same for people living in the same county with the same income level.

Trip tables — trip distribution from each TAZ to all other TAZ's ∝ are separated by auto and transit. Transit is further separated into "Transit-All" and "Transit-Limited." Transit-All includes all transit modes, while Transit-Limited is defined as all transit modes excluding express bus and rail.

As mentioned above, the accessibility measurement is defined as the *percent* of total available regional opportunities within 30-minute travel time by auto, and 45 minutes by transit. For instance, if a particular group in a specific TAZ can reach 50,000 job opportunities within a 45-minute bus ride, while the total SCAG regional jobs are 1,000,000, the job accessibility for this group of bus riders is calculated as 50,000 ∋ 1,000,000 = 5%. Accessibility is calculated at the TAZ level, and can be aggregated to any larger geographical area, such as cities, subregions, counties, and region.

The travel time matrix is processed using a 30-minute travel time criterion for auto, and then total trips within 30 minutes in the trip tables are summarized. In addition, the numbers of jobs that can be reached within 30-minute travel time from each TAZ are summarized. The accessibility for each TAZ is calculated by dividing the total regional jobs by the number of jobs within a 30-minute travel time. This process is repeated for transit travel time matrices using a 45-minute criterion.

The accessibility measure for all modes combined is also calculated for each TAZ. This is done by calculating a weighted average based on the proportion of trip making by mode. Thus automobiles, which are used for more trips than other modes, have greater weight in calculating TAZ accessibility. For example, if the job accessibility by auto, Transit-Limited, and Transit-All is 10%, 2% and 5%, respectively, while the number of trips made to access these job opportunities by mode is 70,000, 10,000, and 20,000, the job accessibility of this TAZ is calculated as (70,000*10% + 10,000*2% + 20,000*5%) ∋ (70,000 + 10,000 + 20,000) = 8.2%.

SCAG also calculates accessibility by income. The ratios of trip making by income groups are calculated at the county level based on Public Use Microdata Samples from the U.S. 1990 Census. As for ethnicity, accessibility for each income group is calculated by weighting trip making by each income group, assuming that all groups with the same

income level have the same travel behavior (trip making rate). The trip making of any ethnic group is assumed to be proportional to its representation within that income quintile (as summarized in Figure I.14).

The analysis shows that all ethnic and income groups should benefit about equally from improvements in accessibility due to the 2001 RTP (see Table I.5). When all modes of travel are considered, all income and ethnic groups will benefit from roughly a 12% improvement in accessibility to retail jobs, service jobs, or total jobs. The actual accessibility levels are projected to increase from 9.9% (baseline) to 11% (Plan). The results for automobile use are essentially the same, since the vast majority of work trips in the region are made by car.

Table I.5

Accessibility Gains Due to 2001 RTP Update			
(expressed as underline percentage increase over baseline in the following statistic: Percent of region's jobs accessible within 30 minutes by car or 45 minutes by transit)			
All Modes of Travel Combined			
Income Quintile	**Retail Jobs**	**Service Jobs**	**All Jobs**
I (lowest)	12%	12%	12%
II	12%	12%	12%
III	12%	12%	12%
IV	12%	12%	12%
V	11%	12%	11%
Total	12%	12%	12%
Ethnic Group			
White	11%	11%	11%
African-American	13%	13%	12%
Native-American	12%	12%	12%
Asian/Pac. Islander	11%	12%	12%
Other	14%	14%	14%
Latino	13%	13%	13%
By Low-Cost Transit Within 45 Minutes			
Income Quintile	**Retail Jobs**	**Service Jobs**	**All Jobs**
I (lowest)	25%	14%	16%
II	26%	15%	17%
III	26%	15%	17%
IV	25%	13%	15%
V	24%	11%	13%
All	25%	14%	16%
Ethnic Group			
White	20%	7%	7%
African-American	20%	10%	14%
Native-American	16%	0%	3%
Asian/Pac. Islander	28%	18%	19%
Other	28%	16%	20%
Latino	27%	16%	18%

Persons who use low-cost transit (specifically, urban rail or local buses) will experience even more improvement in accessibility to jobs under the Plan compared with the

baseline. Their accessibility will improve about 16% overall, though this increase represents a rise from only 2.4% to 2.8% of jobs in the region. Clearly, persons who are limited to low-cost transit face a likewise limited supply of employment opportunities.

Increases in job accessibility via low-cost transit due to the RTP will also be about the same for all income categories. Among ethnic categories there are greater differences, with larger improvements being projected for African-Americans, Asian/Pacific Islanders, and Latinos (see Table I.5). The results for Native Americans, which show the smallest improvements in job accessibility, deserve further study. However, the actual job accessibility by low-cost transit under the 2001 RTP is projected to be very similar across income categories (see Figure I.15a), while it is somewhat higher for Latinos and Asian/Pacific Islanders than for other racial categories (see Figure I.15b).

Figure I.15a

Job Accessibility Via Low-Cost Transit Under 2001 RTP by Income Group

Figure I.15b

Job Accessibility Via Low-Cost Transit Under 2001 RTP by Race/Ethnicity
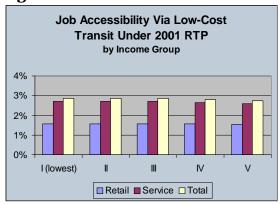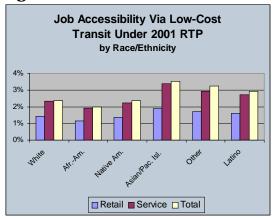
The most dramatic improvements in accessibility – ranging from a 70% to a 168% improvement from Baseline to Plan – will be enjoyed by those who are able to take advantage of any form of transit. As shown in Figures I.16a and I.16b, respectively, job accessibility by any transit mode within 45 minutes under the Plan will be similar for all income groups and fairly similar for all ethnic and racial groups in the region.

Furthermore, the accessibility increases for all transit modes due to the plan will be essentially the same for all income quintiles (see Figure I.17).

Figure I.16a
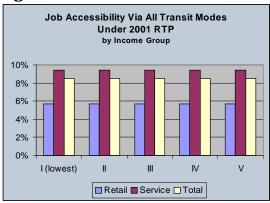
Figure I.16b
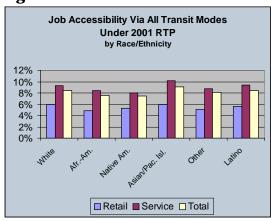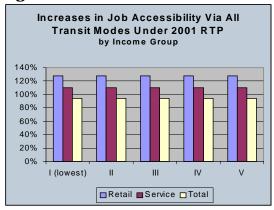
Figure I.17

As mentioned above, since the majority of the region's work trips are taken by car, the accessibility improvements for auto usage are very similar to the results for all modes combined, which are summarized in Table I.5. Projected results for accessibility by car

under the 2001 RTP for the various income groups and racial/ethnic groups are summarized in Figures I.18a and I.18b, respectively.

Figure I.18a
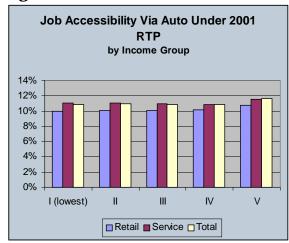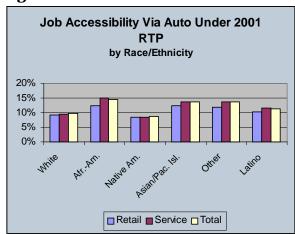
Figure I.18b
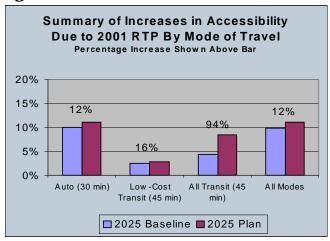
In general, the foregoing analysis has shown that there are no dramatic disparities in accessibility between income groups and ethnic groups in the region within a given mode and time of travel. Recall that the analysis was designed to determine whether accessibility under the plan differed by race or income, since the original time savings analysis (based on wage rate) showed that most benefits would accrue to higher income groups. This analysis has shown that, when the travel mode and time are held constant for all groups, generally there are no major differences in accessibility by race or by income.

However, there are disparities between modes. The overall results of the accessibility analysis are summarized in Figure I.19. The Plan will create the largest improvements in accessibility to jobs and essential services for trips made using any form of transit – about a 94% increase overall. However, the figure clearly confirms the fact that accessibility is much better in general if one has access to a car. In particular, accessibility via low-cost

transit still amounts to only about 3% of the region's opportunities within a 45-minute trip – clearly an issue for those who are restricted by their resources to using this mode of travel. This result is likely a reflection of the region's past land use and transportation investment choices. SCAG's policy committees and transportation planning task forces will address this disparity in their future work.

Figure I.19

Supporting data for this analysis are provided at the end of this Technical Appendix.

IV.   Environmental Impact Analyses

In addition to the analyses of economic costs, benefits, and accessibility gains arising from the 2001 Regional Transportation Plan (Plan), SCAG also assesses the distribution of the projected environmental impacts of the Plan. The key analyses described here are focused on air emissions and noise. The impacts assessed are the same as those presented in the Program Environmental Impact Report (PEIR) for the 2001 RTP. Generally, the analyses discussed here compare the impacts of the Plan with the baseline impacts – those that would occur in the plan horizon year of 2025 if the Plan were not enacted.

Air Emissions

It is important to note that total emissions of all pollutants (except SO_x and PM_{10}) in the region will decrease substantially compared to existing conditions with or without the Plan, due to the combination of measures being taken to meet air quality standards. Since the Plan must demonstrate conformity with regional air quality management plans that call for reductions in emissions of air pollutants, the Plan itself will likewise result in reductions of pollutant emissions. This is generally because the Plan investments will alleviate roadway congestion and provide a greater range of alternatives to the use of a car. The following analysis, however, is based on a comparison of Plan to Baseline conditions, rather than a comparison of Plan to current conditions.

SCAG faced several difficulties in assessing the air quality impacts of the 2001 RTP. Most notable is the fact that SCAG did not have the tools necessary to estimate ambient concentrations of air pollutants. These concentrations are a more accurate indicator of human exposure and potential health effects of air pollutants, since pollutants are dispersed by weather patterns after being emitted, often traveling many miles from their source. Since it was not possible to model this pollutant transport, the analysis is based on modeled emissions only.

Since pollutant concentration levels could not be estimated, the geographic emissions distribution analysis presented here focuses on pollutants that tend to have localized effects which are generally proportionate to emissions – carbon monoxide (CO) and fine particulate matter (PM_{10}). The analysis does not cover pollutants that do not have localized effects proportionate to emissions, but are regionally distributed as a result of chemical interactions, photochemical reactions and meteorology (VOC, NO_x, and SO_x).

In addition to not being based on concentrations, this methodology assumes that all residents in a given transportation analysis zone (TAZ) are equally exposed. Generally both CO and PM_{10} tend to impact those located closest to the source of emissions. Thus, in a TAZ containing a roadway, those closest to the roadway would experience greater emissions and potential health impacts than those located further away. This differential as it might exist within TAZ's is not addressed by this analysis: only differences between the aggregate demographic totals of (different) TAZ's are addressed. Notwithstanding these assumptions, the methodology presents a reasonable gross measure of air quality impacts of mobile sources in the region.

As mentioned above, the analysis of the distribution of impacts was based on the difference between Plan and Baseline emissions. Emissions estimates for the Plan and Baseline were generated using the Direct Travel Impact Model (DTIM), which processes data produced by SCAG's regional transportation model. The data is produced at the transportation analysis zone (TAZ) level. Since the emissions data is derived from the transportation model, only the SCAG five-county modeling area is covered by this analysis. Imperial County is not included in the analysis.

Criteria Pollutants

Impacts for criteria pollutants (PM_{10} and CO) were determined as follows:

1. DTIM modeling results were obtained for these two pollutants for the 2025 Plan and 2025 Baseline at the TAZ level. These results express emission rates in kg/day.
2. The difference between Plan and Baseline emissions for each TAZ was calculated (Plan minus Baseline for each TAZ). In most cases this is a negative number – i.e., emissions in most TAZ's will be lower with the Plan than without it.
3. The result for each TAZ was divided by the land area of that TAZ in square kilometers (km^2). This was done to "normalize" emissions for land mass – in other words, to account for the fact that the same amount of emissions could affect residents of a large TAZ differently from those of a small TAZ. These results are expressed in $kg/day/km^2$.
4. The regional change in emissions exposure was calculated for each pollutant by computing a regional average of the emissions changes (again, mostly negative) for all TAZ's, weighted by the population in each TAZ. This was done in total (for all persons) and individually for each demographic group included in the environmental justice analysis to detect any differences in the emissions exposure. For example, for all persons the calculation was as follows ("Ơ" indicates the sum over all TAZ's):

$$\frac{\text{Ơ(Number of persons in TAZ) x (emissions exposure in TAZ } [kg/day/km^2])}{\text{(Total number of persons in all TAZ's)}}$$

For any given demographic group, e.g., non-white, the calculation was as follows:

$$\frac{\text{Ơ(Number of non-white persons in TAZ) x (emissions exposure in TAZ } [kg/day/km^2])}{\text{(Total number of non-white persons in all TAZ's)}}$$

These calculations produced estimates of the change in regional average emissions exposure due to the 2001 RTP, in $kg/day/km^2$, that could be compared for various demographic groups.
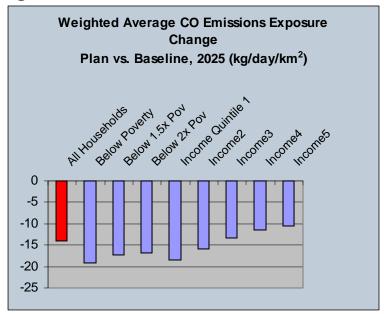
Overall, the region will experience a decrease in CO emissions and in vehicular PM_{10} emissions.[8] Since this is the case, all groups in the region will also experience a decrease

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[8] Emissions of dust associated with roadway use were not included as part of this analysis. However, these emissions will be distributed according to vehicle miles traveled, and would change only the magnitude of the changes calculated. It would not change the relative impacts on the various demographic groups.
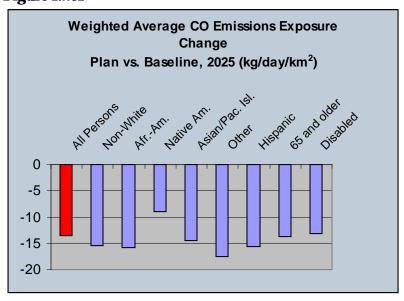
and there is no significant impact, in the sense indicated by environmental justice guidance. Generally, the decreases experienced by the demographic groups of concern for environmental justice are at least as large as those experienced by all persons in the SCAG region. Figure I.20a compares the decreases in CO emissions exposure (Plan vs. Baselin) experienced by various groups by income, while Figure I.20b shows the comparison for racial/ethnic groups, age, and disability. The latter figure shows a smaller decrease for Native Americans than for the region as a whole, but since this is still a decrease, there is no significant impact.

Figure I.20a

Weighted Average CO Emissions Exposure Change
Plan vs. Baseline, 2025 ($kg/day/km^2$)

For definitions of poverty level and income Q1-Q5, refer to Table I.1.

Figure I.20b

Weighted Average CO Emissions Exposure Change
Plan vs. Baseline, 2025 ($kg/day/km^2$)

The reductions in vehicular PM_{10} show a very similar pattern, but are smaller in magnitude (see Figures I.21a and I.21b, for income groups and other demographic groups, respectively).

Figure I.21a

Weighted Average PM_{10} Emissions Exposure Change
Plan vs. Baseline, 2025 (kg/day/km^2)

Figure I.21b

Weighted Average PM_{10} Emissions Exposure Change
Plan vs. Baseline, 2025 (kg/day/km^2)
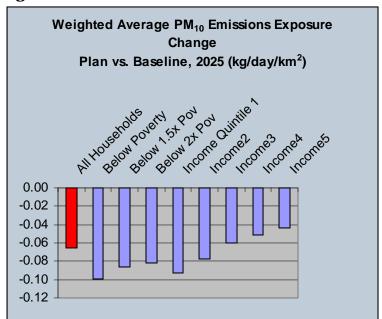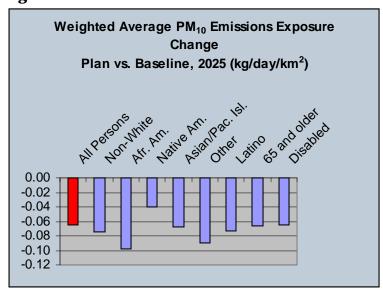
Air Toxics

Also of interest are potential health effects resulting from so-called "air toxics" – pollutants that are not regulated by federal or state air quality standards and that are emitted by mobile sources and have the potential to have localized effects. A recent

modeling and monitoring study by the South Coast Air Quality Management District indicated that 90% of cancer risk from air pollutants in the air basin arises from mobile source emissions. Furthermore, the study found that 70% of cancer risk is attributable to diesel particulate.[9]

SCAG's DTIM modeling results allow the separate estimation of particulate exhaust emissions from heavy-duty vehicles. Considering this data to be the closest approximation to the diesel particulate implicated in the SCAQMD's study, the above analysis was repeated using only the particulate exhaust emissions from heavy-duty vehicles. The results are very similar to those found for the CO and vehicular PM10 analyses. All groups will experience a decrease in emissions exposure, and most groups of concern from an environmental justice perspective will experience a greater decrease than the region as a whole (see Figures I.22a and I.22b).

Figure I.22a

Weighted Average PM_{10} Exhaust Emissions
Exposure Change
Plan vs. Baseline, 2025 (kg/day/km^2)

Figure I.22b

Weighted Average PM_{10} Exhaust Emissions
Exposure Change
Plan vs. Baseline, 2025 (kg/day/km^2)

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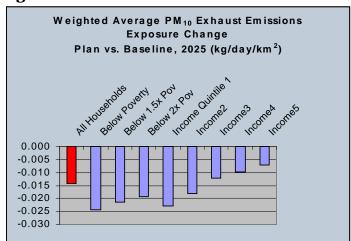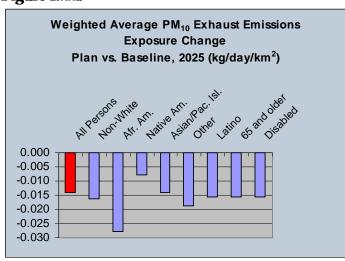
[9] Final Report, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-II), South Coast Air Quality Management District, March 2000, pp. ES-3, ES-9.

Noise

SCAG's analysis of noise considers two sources: aviation noise (from aircraft at the region's airports) and highway noise. While other transportation modes, such as trains, also create noise, insufficient data was available to analyze these impacts. Because of differences in the data sources, and varying standards used to regulate the different sources, SCAG's analysis takes a different approach for aviation noise than for highway noise. Given the metrics used for the noise analyses, it is not appropriate to combine the data to estimate aggregate noise impacts of the Plan.

Aviation Noise

Projected noise impacts from aircraft operations at the region's airports in 2025 were modeled for inclusion in the PEIR for the RTP. For each airport, modeling produced a contour or isoline for the 65 decibel (dB) Community Noise Equivalent Level (CNEL), a measure of noise that takes into account both the number and the timing of flights as well as the mix of aircraft types. The Federal Aviation Administration (FAA) considers residences to be an "incompatible land use" with noise at or above this CNEL level.

To identify potentially impacted populations, the anticipated population within the 65 dB CNEL contour was calculated by the following steps:
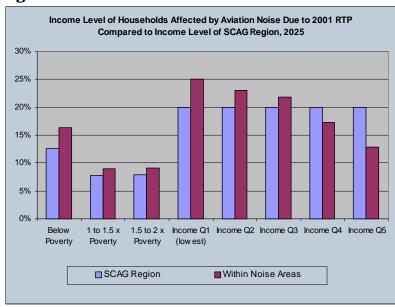
1. Calculating the percentage of residentially zoned land (as identified by applicable General Plans) in any TAZ that would lie within a 65 dB CNEL contour.
2. Assigning the SCAG projected population for each TAZ to the residential area, assuming that the population would be distributed evenly across the residentially-zoned land and that no population would occur in non-residentially zoned land.
3. Applying the demographic breakdown of the TAZ as a whole to the population within the 65 dB CNEL contour.

For example, consider a TAZ 100 acres in size with a 2025 forecast population of 200, where half the total TAZ area falls within the 65 dB CNEL. If 50 acres of the TAZ is residentially zoned, and all 50 residentially zoned acres were within the 65 dB CNEL, then 100% of the projected population of that TAZ (200 people) would be counted as being within the 65 dB CNEL contour. If, however, only 20% of the residentially zoned land were within the 65 dB CNEL contour, then 20% of the TAZ's projected population (40 people) would be counted as being within the contour.

Continuing, if 75% of the TAZ's entire population were non-white, then 75% of the TAZ population within the 65 dB CNEL contour would be assumed to be non-white. The total population in each demographic category was added up for all TAZ's affected by the 65 dB CNEL contour at all of the airports in each scenario to produce a system-wide total.
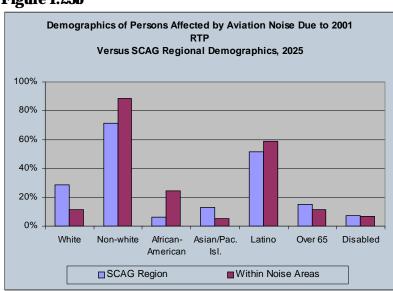
The results summarized in Figures I.23a and I.23b indicate that the 2001 RTP is projected to have a disproportionate aviation noise impact on minority groups. Although non-whites are expected to comprise 71% of the region's population in 2025, they will make up 89% of those affected by the 65 dB CNEL contour under the RTP (see Figure I.23b). In particular, while African-Americans are predicted to represent 6% of the region's population in 2025, they will comprise over 20% of those affected by aviation noise. Latinos and the poor, particularly those households in the lowest income group (see Figure I.23a), would also be disproportionately affected by aviation noise according to this analysis.

Figure I.23a

For definitions of poverty level and income Q1-Q5, refer to Table I.1.

Figure I.23b

These effects have been considered by SCAG's Regional Council and played a significant role in selection of a regional aviation scenario from among several alternatives. In particular, the scenario selected, by limiting expansion of Los Angeles International Airport (LAX), minimized the impact of aviation noise on low-income and minority groups in the region. This is due to the relatively high concentration of low-income and minority populations around LAX.

Highway Noise

Noise associated with highway traffic depends on traffic volumes, vehicle speed, vehicle fleet mix (cars, trucks), as well as the location of the highway with respect to sensitive receptors. According to Federal Highway Administration (FHWA) guidance, noise impacts occur when noise levels increase substantially when compared to existing noise levels. For purposes of this analysis (consistent with FHWA guidance), noise increases of 3 dB along highways where noise levels are currently, or would be in the future, above 66 dB, are considered to be significant (regardless of adjacent land use).

Like the air quality analysis, the highway noise analysis assumes that all people in a TAZ with a highway that experiences a significant increase in noise would be equally affected. As discussed above for air quality, it would only be those closest to the highway that would experience any adverse impacts, not everyone in a TAZ with a highway meeting the noise criteria. Also, the analysis identifies an impact even when a land use not sensitive to noise (for example, industrial) is located adjacent to a highway.
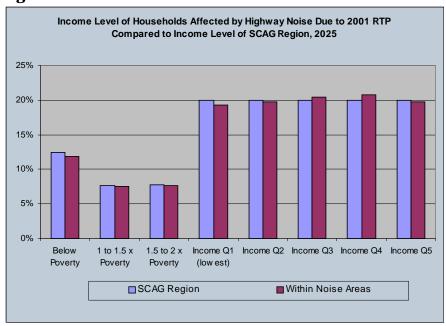
Highways that would be expected to have an increase of 3 dB or more include those where any of the following would occur: (1) the total traffic volumes increase by 100 percent compared to existing conditions; (2) the medium/heavy truck traffic volumes increase by 130 percent compared to existing conditions; or (3) the medium/heavy truck traffic volumes increase by 100 percent and there is an increase in other traffic volumes by 50 percent. These highway segments were identified using the results of SCAG's regional transportation model.

On some highways, there is no potential for noise levels to reach 66 dB. To eliminate these from the analysis, the following criteria were applied: (1) arterials where the FHWA's Traffic Noise Model (TNM) indicated that the motor vehicle volume (and the percentage of medium/heavy trucks) would result in traffic noise levels less than 66 dB; (2) arterials where the calculated motor vehicle speed was less than 17 mph; or (3) freeways where the average volume-to-capacity ratio was equal to or greater than 1.0, which would result in vehicle speeds of less than 30 mph. If a highway met any one of these criteria, it was eliminated from further consideration.

For each highway segment where a significant increase in noise would occur, the corresponding TAZ's were identified. The demographic characteristics of each impacted TAZ were aggregated and compared with the regional demographics to determine if there would be any disproportionate impacts to any of the EJ demographic groups identified in Section I of this Appendix.
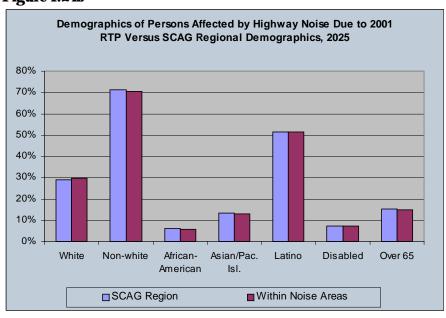
This analysis did not suggest that a disproportionate impact is likely (see Figures I.24a and I.24b). The TAZ's that have highways that meet the noise criteria under the Plan have demographics that are similar to the demographics of the region as a whole. Furthermore, the results for income categories show that in no case would low-income groups be disproportionately affected by highway noise increases due to the Plan.

Figure I.24a

For definitions of poverty level and income Q1-Q5, refer to Table I.1.

Figure I.24b

V.   Conclusions
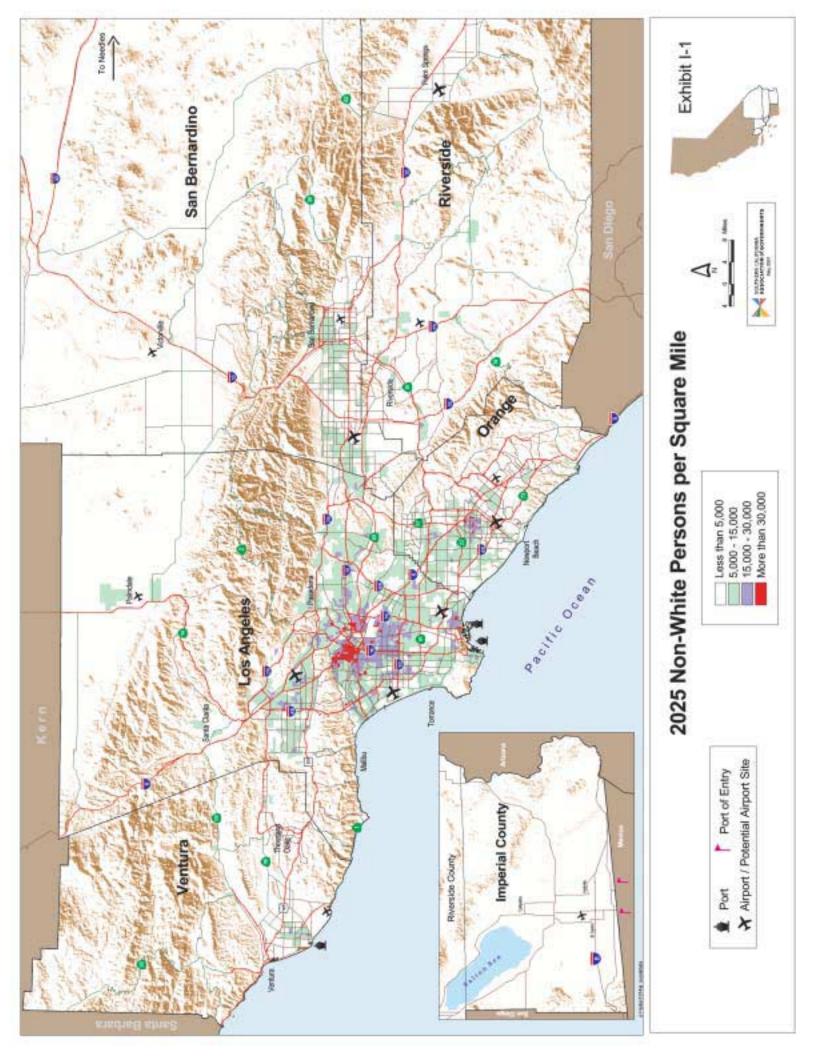
This analysis has presented a number of different views of the distribution of the benefits, costs, and impacts of the 2001 Regional Transportation Plan. Generally, most of the analyses have shown that there will be a disproportionate benefit on low-income groups or that benefits will be distributed in proportion to representation in the SCAG region. Costs and impacts generally will not disproportionately affect low-income and minority populations, the elderly or the disabled, with the possible exception of aviation noise.
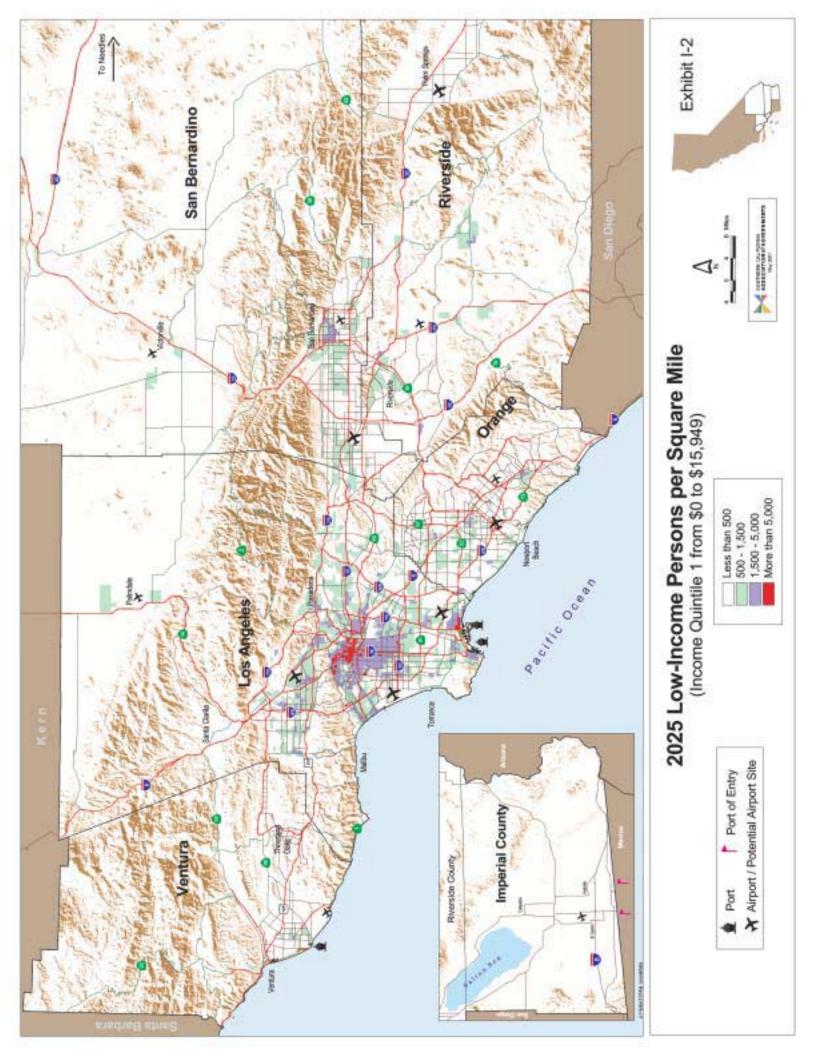
For example, Plan expenditures by travel mode, including baseline expenditures, are such that the lowest income group (representing 15% of households in the region) would enjoy about 30% of the total public and private expenditures, and 34% of just the public expenditures. Taken together, the two lowest income categories, representing 33% of households, would receive over 50% of the public expenditures in the Plan. Plan funding, however, comes largely from more regressive sales and gasoline taxes, though the specific source of the funding for Plan projects cannot be identified for analysis.
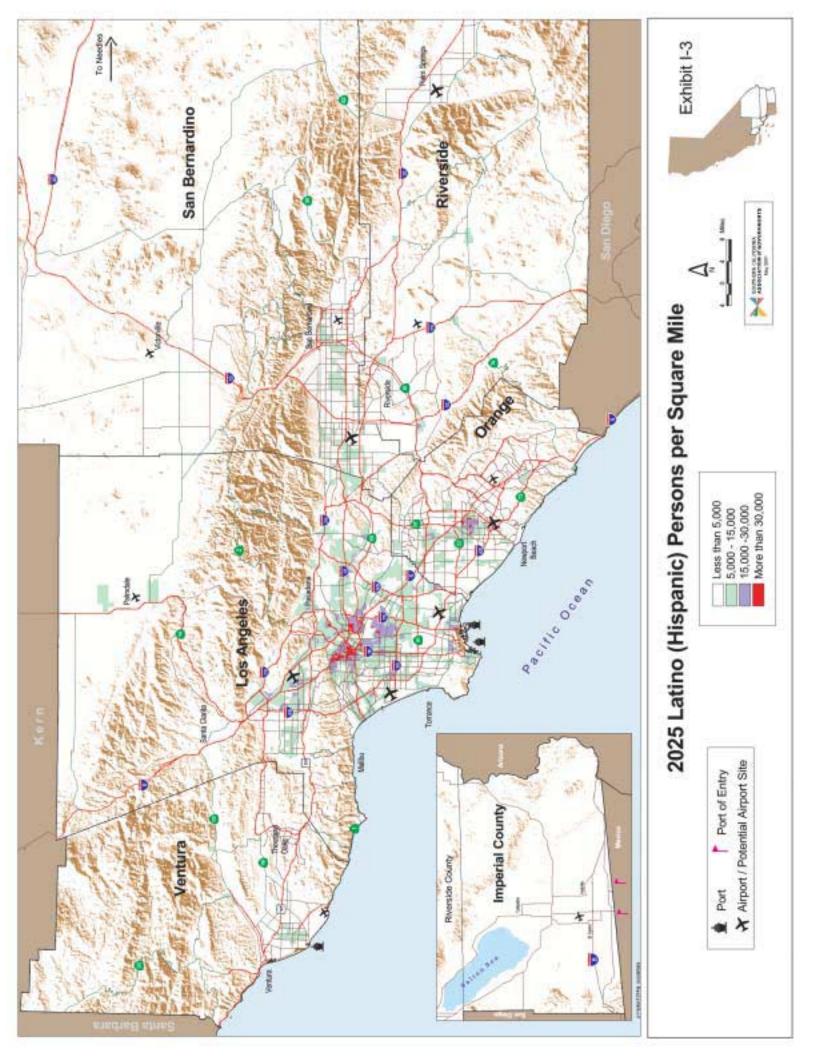
The benefit of time savings resulting from the Plan would track very closely the share of trip making, regardless of mode (auto or transit). The Plan also will improve accessibility to jobs, including retail and service jobs, to about the same extent regardless of income category or ethnicity for any given travel mode and time. These analyses indicate that, while the plan investments will not have a disparate impact in terms of their benefits to various income groups or ethnic groups using the same mode of travel, the plan by itself will not address the disparity between accessibility by low-cost transit modes, such as local bus and urban rail, and accessibility by car, which is much greater. This disparity will continue to be examined and addressed by SCAG in future.
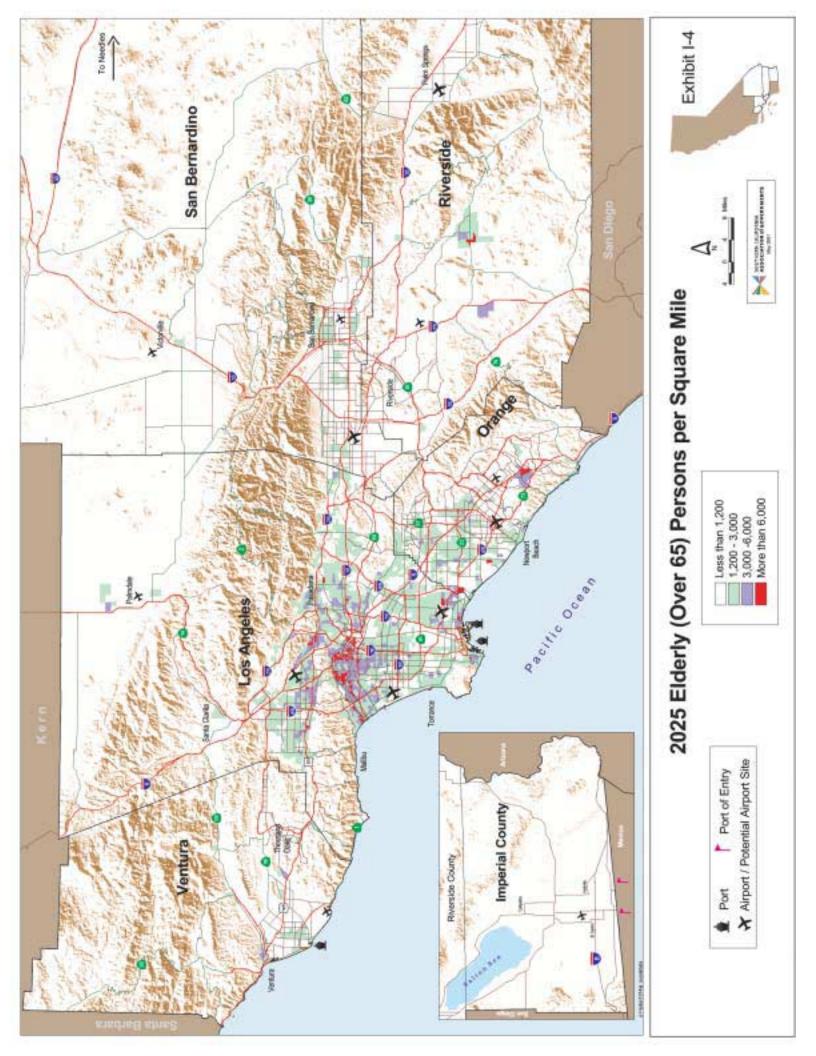
Environmental impact analyses show that air emissions and highway noise should generally not disproportionately affect minorities, low-income, the elderly, or the disabled. Again, it is important to keep in mind that the region as a whole will experience overall air quality improvements due to ongoing mobile source emission controls and investments in the Plan. Only the aviation noise analysis indicates that minority and low-income persons may be disproportionately affected, based on a system-wide analysis. The selection of a regional aviation scenario that distributes (decentralizes) aviation demand to all the region's airports will minimize this disproportionate impact.
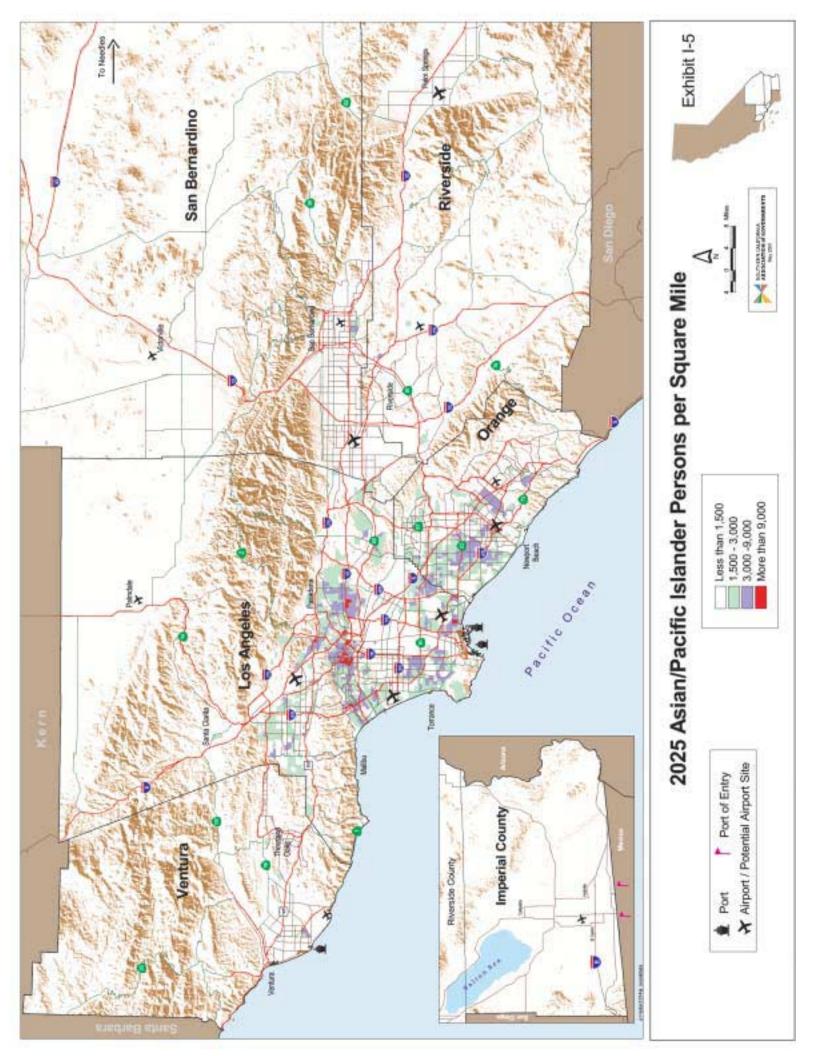
When all the analyses are considered together, the Plan appears to do a reasonably good job of meeting the environmental justice constraints: not placing a disproportionate burden of impact or cost on those least able to afford it. Again, environmental justice does not create an entitlement, but it does attempt to assure that the Plan will not have a discriminatory effect on minorities, low-income, the elderly, or the disabled. The analyses presented here show that the Plan has largely met these expectations.

2025 Non-White Persons per Square Mile

Legend:
- Less than 5,000
- 5,000 – 15,000
- 15,000 – 30,000
- More than 30,000

- Port
- Port of Entry
- Airport / Potential Airport Site

Exhibit I-1

SOUTHERN CALIFORNIA
ASSOCIATION OF GOVERNMENTS
May 2001

2025 Low-Income Persons per Square Mile
(Income Quintile 1 from $0 to $15,949)

Exhibit I-2

Counties shown: San Bernardino, Riverside, Orange, Los Angeles, Ventura, Kern, Santa Barbara, San Diego

Cities/places labeled: Needles (To Needles), Victorville, Palmdale, San Bernardino, Riverside, Newport Beach, Santa Clarita, Ventura, Malibu, Torrance

Imperial County (inset) — Salton Sea, Riverside County, Arizona, Mexico

Pacific Ocean

Legend

Persons per Square Mile
- Less than 500
- 500 - 1,500
- 1,500 - 5,000
- More than 5,000

- Port
- Port of Entry
- Airport / Potential Airport Site

Southern California Association of Governments
May 2001

2025 Latino (Hispanic) Persons per Square Mile

Exhibit I-3

Legend

Less than 5,000
5,000 - 15,000
15,000 - 30,000
More than 30,000

Port
Port of Entry
Airport / Potential Airport Site

Pacific Ocean

Kern
Ventura
Los Angeles
San Bernardino
Riverside
Orange
San Diego

Imperial County
Riverside County
Salton Sea
Mexico

To Needles

2025 Elderly (Over 65) Persons per Square Mile

Exhibit I-4

Legend:
- Port
- Port of Entry
- Airport / Potential Airport Site

Persons per Square Mile:
- Less than 1,200
- 1,200 - 3,000
- 3,000 - 6,000
- More than 6,000

Counties shown: Santa Barbara, Ventura, Kern, Los Angeles, San Bernardino, Riverside, Orange, San Diego, Imperial County

Pacific Ocean

Inset: Imperial County, Riverside County, Salton Sea

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

2025 Asian/Pacific Islander Persons per Square Mile

Legend:
- Less than 1,500
- 1,500 - 3,000
- 3,000 - 9,000
- More than 9,000

- Port
- Port of Entry
- Airport / Potential Airport Site

Exhibit I-5

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
May 2001

Counties: San Bernardino, Riverside, Orange, Los Angeles, Ventura, Kern, San Diego, Santa Barbara, Imperial County

Pacific Ocean

Exhibit I-6

2025 African-American Persons per Square Mile

Kern

Ventura

Santa Barbara

Los Angeles

San Bernardino

To Needles

Riverside

Orange

San Diego

Palm Springs

Victorville

San Bernardino

Riverside

Palmdale

Santa Clarita

Pasadena

Newport Beach

Torrance

Malibu

Thousand Oaks

Ventura

Pacific Ocean

Legend

Less than 800
800 - 4,000
4,000 - 8,000
More than 8,000

Port
Port of Entry
Airport / Potential Airport Site

Inset: Imperial County

Imperial County

Riverside County

Salton Sea

Mexico

Arizona

SOUTHERN CALIFORNIA
ASSOCIATION of GOVERNMENTS
May 2001

N
Miles

2025 Plan Goods Movement Projects

The SCAG Region
2001 RTP

Exhibit I-7

Southern California Association of Governments
April 2001

Non-White Persons per Sq. Mi.
- Less than 5.0K
- 5.0K - 15.0K
- 15.0K - 30.0K
- More than 30K

- Port
- Port of Entry
- Airport / Potential Airport Site

Goods Movement Projects

Baseline
- Alameda Corridor
- Alameda Corridor East

Draft Plan
- Truck Lanes
- Truck Climbing
- I-5 and I-710 Truck Lanes Long Term Study

- Gateway Cities Grade Crossing Program
- ACE - LA, OR, RIV, SB
- Riverside Grade Crossings (to Indio)
- Southwest Passage

- Rail Capacity Enhancements (Boundary is not precise)
- Potential Inland Ports/ Inland Intermodal Terminals (Boundary is not precise)

Santa Barbara

Ventura

Kern

San Bernardino

Los Angeles

Riverside

Orange

San Diego

Pacific Ocean

To Needles

Santa Clarita

Palmdale

Pasadena

Malibu

Thousand Oaks

Torrance

Newport Beach

Ventura

Orangethorpe Corridor

Imperial County

Riverside County

Mexico

Salton Sea

San Diego

2025 Plan
Goods Movement
Projects

The SCAG Region
2001 RTP

Port
Airport / Potential Airport Site
Port of Entry

HH in Income/
per Sq. MI.
($0 - $15,949)
Less than 0.5K
0.5K - 1.5K
1.5K - 5.0K
More than 5.0K

Goods Movement Projects

Baseline
Alameda Corridor
Alameda Corridor East

Draft Plan
Truck Lane
Truck Climbing
I-5 and I-710
Truck Lanes
Long Term Study

Gateway Cities Grade
Crossing Program
ACE - LA, OR,
RIV, SB
Riverside Grade
Crossings (to Indio)
Southwest Passage

Rail Capacity
Enhancements
(Boundary is not precise)

Potential Inland Ports/
Inland Intermodal
Terminals
(Boundary is not precise)

Exhibit I-8

Southern California Association of Governments
April 2001

2025 Plan — Maglev Projects — The SCAG Region 2001 RTP — Exhibit I-9

2025 Plan Transit Corridor System

Exhibit I-10

The SCAG Region
2001 RTP

Existing in 2000

- Existing Light Rail
- Existing Heavy Rail
- Existing Commuter Rail

Baseline 2025

- Baseline Rapid Bus
- Baseline Busway
- Baseline Light Rail
- Baseline Commuter Rail
- Baseline Rail Technology TBD

Plan 2025

- Future Rapid Bus
- Future Busway
- Future Light Rail
- Future Commuter Rail
- Future Amtrak to Indio
- Amtrak Service Improvements to San Diego & San Francisco

Note: Plan also proposes service improvements on existing commuter rail lines

Non-White Persons per Sq. Mi.

- Less than 5.0K
- 5.0K - 15.0K
- 15.0K - 30.0K
- More than 30.0K

- Port
- Port of Entry
- Airport / Potential Airport Site

Pacific Ocean

San Bernardino

Riverside

Orange

Los Angeles

Ventura

Kern

San Diego

Santa Barbara

Imperial County
Riverside County

To Needles

2025 Plan Transit Corridor System

Exhibit I-11

Southern California Association of Governments
April 2001

Existing in 2000

- Existing Light Rail
- Existing Heavy Rail
- Existing Commuter Rail

HH in Income1 per Sq. Mi.
($0 - $15,940)

- Less than 0.5K
- 0.5K - 1.5K
- 1.5K - 5.0K
- More than 5.0K

Baseline 2025

- Baseline Rapid Bus
- Baseline Busway
- Baseline Light Rail
- Baseline Commuter Rail
- Baseline Rail Technology TBD

Plan 2025

- Future Rapid Bus
- Future Busway
- Future Light Rail
- Future Commuter Rail
- Future Amtrak to Indio
- Amtrak Service improvements to San Diego & San Francisco

Note: Plan also proposes service improvements on existing commuter rail lines

- Port
- Port of Entry
- Airport / Potential Airport Site

The SCAG Region
2001 RTP

Imperial County

San Bernardino
Riverside
Orange
Los Angeles
Ventura
Kern
Santa Barbara
San Diego

Pacific Ocean

2025 Regionally Significant Baseline Projects

Exhibit I-12

Southern California Association of Governments
April 2001

The SCAG Region
2001 RTP

Counties: Kern, Ventura, Santa Barbara, Los Angeles, San Bernardino, Riverside, Orange, San Diego, Imperial County

Pacific Ocean

Legend:

Non-White Persons per Square Mile
- Less than 5.0K
- 5.0K – 15.0K
- 15K – 30.0K
- More than 30.0K

- HOV
- Mixed Flow
- Auxiliary
- Truck Climbing
- Toll
- Transit Corridor
- Alameda Corridor
- Alameda Corridor East
- Metropolitan Transportation System

- HOV Connector
- New Interchange

- Port
- Port of Entry
- Airport / Potential Airport Site

2025 Regionally Significant Baseline Projects

Exhibit I-13

Southern California Association of Governments
April 2001

The SCAG Region
2001 RTP

Legend:

Truck Climbing
HOV
Mixed Flow
Auxiliary
Alameda Corridor
Alameda Corridor East
Metropolitan Transportation System
Toll
Transit Corridor

HOV Connector
New Interchange

Port
Port of Entry
Airport / Potential Airport Site

HH in Income† per Sq. Mi
($8 - $15,340)

Less than 0.5K
0.5K - 1.5K
1.5K - 5.0K
More than 5.0K

Counties labeled: Kern, Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, San Diego, Imperial County

Pacific Ocean

To Needles

2025 Plan
Highway and Corridor Projects

The SCAG Region
2001 RTP

Exhibit I-14

Southern California Association of Governments
April 2001

2025 Plan
Highway and Corridor Projects

The SCAG Region
2001 RTP

Highway and Corridor Projects

HH Income* per Sq. Mi.
($0 - $15,949)

	Less than 0.5K
	0.5K - 1.5K
	1.5K - 5.0K
	More than 5.0K

HOV Connector — ●
Toll Connector — ●
Ramps
Freeway
Interchange — ●
Improvement

Auxiliary
Truck Lane
Truck Climbing

Corridor (Alignment To Be Determined)
Corridor For Further Study
Metropolitan Transportation System

Port
Port of Entry
Airport / Potential Airport Site

Exhibit I-15

Southern California Association of Governments
April 2001

Estimated SCAG Region Taxable Sales and Sales Tax Paid by Quintile--1997

Taxable Sales($1,000)/Income Class	Lowest 20 Percent	Second 20 Percent	Third 20 Percent	Fourth 20 Percent	Highest 20 Percent	SCAG Region
Apparel Store	525,144	834,052	1,081,178	1,427,155	2,310,633	6,178,162
General Merchandise Stores	1,738,585	2,437,269	2,843,481	3,997,121	5,232,004	16,248,461
Gift, art goods, and novelties	48,526	75,411	99,674	152,790	279,350	655,750
Sporting goods	88,527	137,576	181,839	278,740	509,628	1,196,309
Florist	28,106	43,678	57,732	88,496	161,800	379,813
Photographic equipment & supplies	28,436	44,192	58,410	89,536	163,701	384,275
Musical instruments	23,578	61,175	67,548	145,928	339,012	637,241
Stationery and books	177,295	240,371	272,761	441,532	572,798	1,704,756
Jewelry	46,898	72,882	96,331	147,666	269,981	633,759
Office, store, and school supplies	516,925	700,831	795,270	1,287,343	1,670,066	4,970,436
Other specialities	515,614	806,332	1,102,536	1,239,667	1,821,104	5,485,254
Food stores selling all types of liquors	626,576	832,011	986,087	1,212,066	1,479,131	5,135,871
All other food stores	240,746	333,939	363,061	446,546	557,211	1,941,503
Packaged liquor stores	71,143	90,328	146,284	183,854	307,756	799,365
Eating and drinking places	1,123,446	1,591,548	2,260,266	3,263,343	5,135,753	13,374,357
Household and home furnishings	219,281	283,461	433,214	636,450	1,101,754	2,674,161
Household appliance dealers	176,827	236,320	355,306	355,306	528,827	1,652,585
Second-hand merchandise	19,034	25,438	38,245	38,245	56,924	177,886
Farm implement dealers	63,307	84,606	127,205	127,205	189,328	591,650
Farm and garden supply stores	47,309	64,140	72,784	117,818	152,845	454,897
Fuel and ice dealers	10,431	12,850	14,437	17,158	20,711	75,588
Building materials	525,636	841,017	959,285	1,498,062	2,746,447	6,570,447
New motor vehicle dealers	583,142	1,379,629	2,745,035	3,569,968	5,945,206	14,222,981
Used motor vehicle dealers	143,861	257,352	303,708	485,932	407,608	1,598,461
Automotive supplies and parts	149,951	265,985	324,894	412,365	631,936	1,785,131
Services stations	880,962	1,377,675	1,827,528	2,399,216	2,886,557	9,371,939
Mobile homes, trailers, and campers	5,092	22,277	27,793	52,404	104,595	212,160
Boat, motorcycle, and plane dealers	14,591	63,837	79,644	150,168	299,728	607,968
Business and personal services	511,447	818,316	1,038,631	1,856,947	3,643,078	7,868,420
All others	4,206,487	6,214,129	8,317,373	11,328,836	17,734,169	47,800,994
Estimated taxable sales by quintile	13,356,905	20,248,627	27,077,540	37,447,865	57,259,643	155,390,580
Percent of taxable sales by quintile	8.6%	13.0%	17.4%	24.1%	36.8%	100.0%
Estimated sales and use tax paid by quintile (right scale, in $000)	1,069,266	1,620,972	2,167,649	2,997,829	4,583,830	12,439,546
As a percent of Adjusted Gross Income	12.4%	10.0%	7.4%	5.9%	2.8%	4.6%

Source: Estimated by Economic Analysis Division based on "Taxable Sales in California, 1997", "Consumer Expenditure Survey, 1996-97", and California Franchise Tax Board's "1997 Annual Report."

Southern California
Association of Governments

Estimated SCAG Region Gasoline Tax Paid by Quintile--1997

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Estimated gasoline tax paid by quintile (right scale, in $000)	290,292	453,967	602,201	790,582	1,036,312	3,173,355
As a percent of Adjusted Gross Income	3.4%	2.8%	2.1%	1.5%	0.4%	1.9%
Percent of gasoline tax by Quintile	9.1%	14.3%	19.0%	24.9%	32.7%	100.0%

Estimated SCAG Region Sales and Gasoline Tax Paid by Quintile--1997

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Percent of toal sales and gasoline taxes paid by quintile	8.7%	13.3%	17.7%	24.3%	36.0%	100.0%
As a percent of CA Adjusted Gross Income	15.8%	12.8%	9.4%	7.4%	3.4%	5.8%
Estimated sales and gasoline taxes paid by quintile (right scale, in $000)	1,359,558	2,074,939	2,769,851	3,788,412	5,620,142	15,612,901

Estimated SCAG Region Gasoline Tax Paid by Quintile--1997

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Percent of gasoline tax by Quintile	9.1%	14.3%	19.0%	24.9%	32.7%	100.0%
As a percent of Adjusted Gross Income	3.4%	2.8%	2.1%	1.5%	0.4%	1.9%
Estimated gasoline tax paid by quintile (right scale, in $000)	290,292	453,967	602,201	790,582	1,036,312	3,173,355

Estimated SCAG Region Sales and Use Tax Paid by Quintile--1997

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Percent of taxable sales by quintile	8.6%	13.0%	17.4%	24.1%	36.8%	100.0%
As a percent of Adjusted Gross Income	12.4%	10.0%	7.4%	5.9%	2.8%	4.6%
Estimated sales and use tax paid by quintile (right scale, in $000)	1,069,266	1,620,972	2,167,649	2,997,829	4,583,830	12,439,546

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Percent of AGI by income class	3.2%	6.0%	10.9%	19.0%	60.8%	100.0%
Percent of income tax paid by income class	0.1%	0.6%	3.0%	11.0%	85.3%	100.0%
Income tax paid as a percent of AGI	0.2%	0.4%	1.1%	2.3%	5.5%	3.9%
Estimated income tax paid (right scale, in $000)	12,973	58,109	319,819	1,161,497	8,972,364	10,524,761

Tax Burdens

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V	Total
Income Tax	0.2%	0.4%	1.1%	2.3%	5.5%	
Sales & Use Tax	12.4%	10.0%	7.4%	5.9%	2.8%	
Gasoline Tax	3.4%	2.8%	2.1%	1.5%	0.4%	

Savings by Income & Race/Ethinicity

Auto Saving

PHT_SAV (Total)	129,685,150		
VMT_SAV (Total)	3,294,901		

VHT Saving by Income Quintile		% of Total Saving	% Trip Making
PHT_Q1	9,659,354	7.4%	7.2%
PHT_Q2	20,103,968	15.5%	15.1%
PHT_Q3	29,219,021	22.5%	21.1%
PHT_Q4	37,673,205	29.0%	28.0%
PHT_Q5	33,029,602	25.5%	28.6%
Total (Check)	129,685,150	100%	100%

VHT Saving by Race/Ethnicity		% of Total Saving	Trip Making
PHT_W	56,110,532	43.3%	41.7%
PHT_B	6,262,106	4.8%	5.5%
PHT_AI	682,024	0.5%	0.4%
PHT_AP	12,863,587	9.9%	12.8%
PHT_O	125,577	0.1%	0.1%
PHT_H	53,641,325	41.4%	39.5%
Total (Check)	129,685,150	100%	100%

Local Transit Saving

PHT_SAV (Total)	14,248,333		

PHT Saving by Income Quintile		% of Total Saving	Trip Making
PHT_Q1	3,814,206	26.8%	23.1%
PHT_Q2	4,353,276	30.6%	29.5%
PHT_Q3	2,979,537	20.9%	22.2%
PHT_Q4	2,091,863	14.7%	16.5%
PHT_Q5	1,009,452	7.1%	8.8%
Total (Check)	14,248,333	100.0%	100.0%

PHT Saving by Race/Ethnicity		% of Total Saving	Trip Making
PHT_W	4,154,935	29.2%	18.7%
PHT_B	1,082,340	7.6%	8.9%
PHT_AI	49,623	0.3%	0.2%
PHT_AP	2,007,525	14.1%	19.2%
PHT_O	30,683	0.2%	0.3%
PHT_H	6,923,227	48.6%	52.6%
Total (Check)	14,248,333	100.0%	100.0%

Total Transit Saving

PHT_SAV (Total)   32,216,053

PHT Saving by Income Quintile		% of Total Saving	Trip Making
PHT_Q1	1,295,728	4.0%	2.0%
PHT_Q2	2,147,412	6.7%	4.0%
PHT_Q3	6,461,532	20.1%	15.0%
PHT_Q4	9,975,677	31.0%	29.0%
PHT_Q5	12,335,705	38.3%	50.0%
Total (Check)	32,216,053	100.0%	100.0%

PHT Saving by Race/Ethnicity		% of Total Saving	Trip Making
PHT_W	11,510,372	35.7%	20.9%
PHT_B	2,253,790	7.0%	10.0%
PHT_AI	131,186	0.4%	0.2%
PHT_AP	4,154,640	12.9%	20.4%
PHT_O	45,022	0.1%	0.2%
PHT_H	14,121,043	43.8%	48.3%
Total (Check)	32,216,053	100.0%	100.0%

Savings by Income & Race/Ethinicity

Total Saving

PHT_SAV (Total)　　　176,149,536

PHT Saving by Income Quintile		% of Total Saving	% Trip Making	
PHT_Q1	14,769,287	8.4%	7.2%	
PHT_Q2	26,604,656	15.1%	15.0%	
PHT_Q3	38,660,089	21.9%	21.0%	
PHT_Q4	49,740,745	28.2%	28.0%	
PHT_Q5	46,374,759	26.3%	28.8%	
Total (Check)	176,149,536	100%	100%	

PHT Saving by Race/Ethnicity		% of Total Saving	% Trip Making	% Households
PHT_W	71,775,839	40.7%	41.4%	40.3%
PHT_B	9,598,236	5.4%	5.6%	6.1%
PHT_AI	862,832	0.5%	0.4%	0.5%
PHT_AP	19,025,753	10.8%	12.8%	11.6%
PHT_O	201,282	0.1%	0.1%	0.1%
PHT_H	74,685,594	42.4%	39.6%	41.5%
Total (Check)	176,149,536	100%	100%	100%

Income	Trips
I	4032242.54
II	8405984.49
III	11779581.3
IV	15680453.15
V	16161905.51
ALL	56060166.99

Race	Trips
W	23205852.25
B	3132941.59
AI	240904.2075
AP	7199250.49
O	53894.79774
H	22226601.68
TOTAL	56059445.02

Auto Accessibility By Income & Race - Plan

Auto-30minutes Plan

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I (lowest)	9.99%	11.05%	10.88%	3,943,753	AA1	7.2%
II	10.06%	11.09%	10.95%	8,281,504	AA2	15.1%
III	10.06%	10.90%	10.86%	11,582,611	AA3	21.1%
IV	10.13%	10.85%	10.89%	15,379,762	AA4	28.0%
V	10.76%	11.58%	11.68%	15,704,141	AA5	28.6%
Total	10.27%	11.12%	11.12%	54,891,771		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	9.30%	9.43%	9.63%	22,914,371	AAW	41.7%
Afr.-Am.	12.33%	15.06%	14.46%	3,035,327	AAB	5.5%
Native Am.	8.44%	8.40%	8.71%	237,891	AAAI	0.4%
Asian/Pac. Isl.	12.31%	13.64%	13.63%	6,984,200	AAAP	12.7%
Other	11.72%	13.72%	13.55%	51,688	AAO	0.1%
Latino	10.37%	11.57%	11.43%	21,667,572	AAH	39.5%
Total	10.27%	11.12%	11.12%	54,891,049		100.0%

Auto-30minutes Baseline

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I	8.85%	9.80%	9.64%	3,949,648	AA1	7.2%
II	8.92%	9.86%	9.72%	8,295,136	AA2	15.1%
III	8.94%	9.70%	9.66%	11,594,572	AA3	21.1%
IV	9.03%	9.69%	9.72%	15,397,077	AA4	28.0%
V	9.67%	10.39%	10.49%	15,751,680	AA5	28.6%
Total	9.17%	9.93%	9.92%	54,988,113		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	8.37%	8.49%	8.66%	22,929,222	AAW	41.7%
Afr.-Am.	10.85%	13.33%	12.83%	3,039,165	AAB	5.5%
Native Am.	7.52%	7.49%	7.76%	238,067	AAAI	0.4%
Asian/Pac. Isl.	11.06%	12.20%	12.18%	7,017,925	AAAP	12.8%
Other	10.21%	11.96%	11.88%	51,933	AAO	0.1%
Latino	9.18%	10.25%	10.14%	21,711,105	AAH	39.5%
Total	9.17%	9.93%	9.92%	54,987,415		100.0%

Auto-30minutes Improvement

Income Quintile	Retail	Service	Total
I	12.95%	12.66%	12.80%
II	12.73%	12.51%	12.62%
III	12.52%	12.34%	12.41%
IV	12.11%	12.04%	12.05%
V	11.26%	11.51%	11.39%
Total	12.08%	12.06%	12.06%

Race/Ethnicity	Retail	Service	Total
White	11.20%	11.07%	11.23%
Afr.-Am.	13.58%	13.03%	12.71%
Native Am.	12.30%	12.19%	12.15%
Asian/Pac. Isl.	11.37%	11.82%	11.84%
Other	14.81%	14.66%	14.13%
Latino	12.99%	12.87%	12.81%
Total	12.08%	12.06%	12.06%

Local Transit Accessibility By Income & Race - Plan

Local Transit-45minutes Plan

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I (lowest)	1.57%	2.70%	2.85%	71,318	AA1	23.0%
II	1.57%	2.72%	2.86%	90,137	AA2	29.1%
III	1.57%	2.70%	2.85%	68,181	AA3	22.0%
IV	1.56%	2.66%	2.80%	51,699	AA4	16.7%
V	1.53%	2.58%	2.72%	28,468	AA5	9.2%
Total	1.57%	2.69%	2.83%	309,802		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	1.41%	2.34%	2.37%	66,191	AAW	21.4%
Afr.-Am.	1.14%	1.93%	1.98%	23,143	AAB	7.5%
Native Am.	1.35%	2.23%	2.37%	768	AAAI	0.2%
Asian/Pac. Isl.	1.87%	3.38%	3.50%	57,143	AAAP	18.4%
Other	1.71%	2.93%	3.24%	865	AAO	0.3%
Latino	1.58%	2.70%	2.91%	161,692	AAH	52.2%
Total	1.57%	2.69%	2.83%	309,802		100.0%

Local Transit-45minutes Baseline

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I	1.25%	2.37%	2.46%	41,025	AA1	23.1%
II	1.25%	2.36%	2.45%	52,289	AA2	29.5%
III	1.25%	2.35%	2.44%	39,326	AA3	22.2%
IV	1.25%	2.35%	2.44%	29,262	AA4	16.5%
V	1.24%	2.33%	2.42%	15,619	AA5	8.8%
Total	1.25%	2.36%	2.44%	177,521		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	1.17%	2.18%	2.21%	33,231	AAW	18.7%
Afr.-Am.	0.95%	1.75%	1.73%	15,876	AAB	8.9%
Native Am.	1.16%	2.23%	2.29%	381	AAAI	0.2%
Asian/Pac. Isl.	1.46%	2.86%	2.94%	34,148	AAAP	19.2%
Other	1.34%	2.52%	2.69%	531	AAO	0.3%
Latino	1.25%	2.33%	2.47%	93,355	AAH	52.6%
Total	1.25%	2.36%	2.44%	177,521		100.0%

Local Transit-45minutes Improvement

Income Quintile	Retail	Service	Total
I	25%	14%	16%
II	26%	15%	17%
III	26%	15%	17%
IV	25%	13%	15%
V	24%	11%	13%
Total	25%	14%	16%

Race/Ethnicity	Retail	Service	Total
White	20%	7%	7%
Afr.-Am.	20%	10%	14%
Native Am.	16%	0%	3%
Asian/Pac. Isl.	28%	18%	19%
Other	28%	16%	20%
Latino	27%	16%	18%
Total	25%	14%	16%

Total Transit Accessibility By Income & Race - Plan

Total Transit-45minutes Plan

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I (lowest)	5.68%	9.43%	8.48%	17,172	AA1	2.0%
II	5.68%	9.43%	8.48%	34,344	AA2	4.0%
III	5.68%	9.43%	8.48%	128,789	AA3	15.0%
IV	5.68%	9.43%	8.48%	248,992	AA4	29.0%
V	5.68%	9.43%	8.48%	429,297	AA5	50.0%
Total	5.68%	9.43%	8.48%	858,594		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	5.92%	9.30%	8.39%	225,290	AAW	26.2%
Afr.-Am.	4.91%	8.47%	7.54%	74,472	AAB	8.7%
Native Am.	5.34%	8.02%	7.42%	2,245	AAAI	0.3%
Asian/Pac. Isl.	5.96%	10.19%	9.10%	157,907	AAAP	18.4%
Other	5.11%	8.77%	8.08%	1,341	AAO	0.2%
Latino	5.58%	9.38%	8.47%	397,338	AAH	46.3%
Total	5.68%	9.43%	8.48%	858,594		100.0%

Total Transit-45minutes Baseline

Income Quintile	Retail	Service	Total	Trips	Variable	Trips %
I	2.50%	4.49%	4.37%	8,926	AA1	2.0%
II	2.50%	4.49%	4.37%	17,852	AA2	4.0%
III	2.50%	4.49%	4.37%	66,944	AA3	15.0%
IV	2.50%	4.49%	4.37%	129,425	AA4	29.0%
V	2.50%	4.49%	4.37%	223,147	AA5	50.0%
Total	2.50%	4.49%	4.37%	446,293		100.0%

Race/Ethnicity	Retail	Service	Total	Trips	Variable	Trips %
White	2.21%	3.84%	3.68%	93,438	AAW	20.9%
Afr.-Am.	2.47%	4.46%	4.43%	44,705	AAB	10.0%
Native Am.	2.01%	3.45%	3.45%	913	AAAI	0.2%
Asian/Pac. Isl.	2.86%	5.26%	4.99%	91,054	AAAP	20.4%
Other	2.54%	4.61%	4.60%	828	AAO	0.2%
Latino	2.48%	4.46%	4.39%	215,355	AAH	48.3%
Total	2.50%	4.49%	4.37%	446,293		100.0%

Total Transit-45minutes Improvement

Income Quintile	Retail	Service	Total
I (lowest)	128%	110%	94%
II	128%	110%	94%
III	128%	110%	94%
IV	128%	110%	94%
V	128%	110%	94%
Total	128%	110%	94%

Race/Ethnicity	Retail	Service	Total
White	168%	143%	128%
Afr.-Am.	99%	90%	70%
Native Am.	165%	132%	115%
Asian/Pac. Isl.	108%	94%	82%
Other	101%	90%	76%
Latino	126%	111%	93%
Total	128%	110%	94%

SCAG Region Accessibility By Race/Ethinicity - Plan

Race/Ethnicity	Retail	Service	Total	Trips
White	9.25%	9.41%	9.60%	23,205,852
Black	12.07%	14.81%	14.21%	3,132,942
American Indian	8.39%	8.38%	8.67%	240,904
Asian & Pacific Island	12.09%	13.49%	13.45%	7,199,250
Other	11.40%	13.42%	13.25%	53,895
Hispanic	10.22%	11.47%	11.32%	22,226,602
Total				56,059,445

SCAG Region Accessibility By Race/Ethinicity - Baseline

Race/Ethnicity	Retail	Service	Total	Total Trips
White	8.33%	8.46%	8.63%	23,055,890
Black	10.68%	13.14%	12.65%	3,099,745
American Indian	7.49%	7.47%	7.74%	239,361
Asian & Pacific Island	10.91%	12.07%	12.05%	7,143,127
Other	10.00%	11.76%	11.67%	53,292
Hispanic	9.08%	10.16%	10.05%	22,019,814
Total				55,611,229

SCAG Region Accessibility By Race/Ethinicity - Improvement

Race/Ethnicity	Retail	Service	Total
White	11%	11%	11%
Black	13%	13%	12%
American Indian	12%	12%	12%
Asian & Pacific Island	11%	12%	12%
Other	14%	14%	14%
Hispanic	13%	13%	13%
Total			

2001 RTP * *TECHNICAL APPENDIX*

SCAG Region Accessibility By Income Quintile - Plan

Income	Retail	Service	Total	Trips
I	9.82%	10.89%	10.72%	4,032,243
II	9.95%	10.99%	10.85%	8,405,984
III	9.96%	10.84%	10.78%	11,779,581
IV	10.03%	10.80%	10.83%	15,680,453
V	10.61%	11.51%	11.58%	16,161,906
Total	10.16%	11.05%	11.03%	56,060,167

SCAG Region Accessibility By Income Quintile - Baseline

Income	Retail	Service	Total	Total Trips
I	8.75%	9.72%	9.56%	3,999,598
II	8.86%	9.80%	9.67%	8,365,277
III	8.88%	9.65%	9.60%	11,700,842
IV	8.97%	9.63%	9.66%	15,555,765
V	9.56%	10.30%	10.39%	15,990,445
Total	9.09%	9.86%	9.85%	55,611,927

SCAG Region Accessibility By Income Quintile - Improvement (Plan vs. Baseline)
All Modes

Income	Retail	Service	Total
I	12.22%	12.09%	12.22%
II	12.28%	12.19%	12.28%
III	12.23%	12.32%	12.29%
IV	11.87%	12.19%	12.05%
V	10.94%	11.78%	11.42%
Total	11.75%	12.09%	11.96%

Summary of Increases in Accessibility Due to 2001 RTP By Mode of Travel

	2025 Baseline	2025 Plan	Increase
Auto (30 min)	9.92%	11.12%	12%
Low-Cost Transit (45 min)	2.44%	2.83%	16%
All Transit (45 min)	4.37%	8.48%	94%
All Modes	9.85%	11.03%	12%

Southern California
Association of Governments

Weighted Average Emissions - Plan Minus Baseline
kg/day/km^2

	CO	PM10	PM10 (HD Exhaust)
All Persons	-13.5	-0.06	-0.014
White	-8.8	-0.04	-0.009
Non-White	-15.4	-0.07	-0.016
Black	-15.8	-0.10	-0.028
Native Am	-9.0	-0.04	-0.008
Asian	-14.4	-0.07	-0.014
Other	-17.5	-0.09	-0.019
Hispanic	-15.6	-0.07	-0.016
65 and older	-13.6	-0.07	-0.016
Under 65	-13.5	-0.06	-0.014
Disabled	-13.1	-0.07	-0.016
Not disabled	-13.5	-0.06	-0.014
All Households	-13.9	-0.07	-0.014
Below Poverty	-19.2	-0.10	-0.024
Below 1.5x Pov	-17.3	-0.09	-0.021
Below 2x Pov	-16.8	-0.08	-0.019
Income Quintile 1	-18.4	-0.09	-0.023
Income2	-16.0	-0.08	-0.018
Income3	-13.2	-0.06	-0.012
Income4	-11.5	-0.05	-0.010
Income5	-10.6	-0.04	-0.007

Highway Noise Impacts
NOTE: Regional totals do not exactly match those shown in RTP due to omission of some unincorporated areas for technical reasons.

SCAG Region 2025	Total Population	Total Households	White Non-Hispanic	Black Non-Hispanic	American Indian Non-Hispanic	Asian/Pacific Islanders Non-Hispanic
Total	22,460,126	7,360,847	6,421,093	1,343,848	77,850	2,937,648

Percentages

			White Non-Hispanic	Black Non-Hispanic	American Indian Non-Hispanic	Asian/Pacific Islanders Non-Hispanic
Total			*28.6%*	*6.0%*	*0.3%*	*13.1%*

2025 Plan
Meet Highway Noise Criteria

	Total Population	Total Households	White Non-Hispanic	Black Non-Hispanic	American Indian Non-Hispanic	Asian/Pacific Islanders Non-Hispanic
LA	6,759,162	2,194,599	1,425,140	388,956	16,713	942,004
Orange	2,183,022	691,532	844,964	38,196	7,262	462,637
Riverside	1,895,316	625,694	782,831	111,191	12,217	141,237
San Bernadino	2,042,552	644,622	670,381	198,418	10,336	148,001
Riverside	495,170	163,217	229,849	9,810	1,981	46,019
Total	13,375,222	4,319,664	3,953,165	746,571	48,509	1,739,898

Percentages

			White Non-Hispanic	Black Non-Hispanic	American Indian Non-Hispanic	Asian/Pacific Islanders Non-Hispanic
LA			21.1%	5.8%	0.2%	13.9%
Orange			38.7%	1.7%	0.3%	21.2%
Riverside			41.3%	5.9%	0.6%	7.5%
San Bernadino			32.8%	9.7%	0.5%	7.2%
Riverside			46.4%	2.0%	0.4%	9.3%
Total			**29.6%**	**5.6%**	**0.4%**	**13.0%**

Highway Noise Impacts

NOTE: Regional totals do not exactly match those shown in RTP due to omission of some unincorporated areas for technical reasons.

SCAG Region 2025	Other Non-Hispanic	Hispanic	Over 65	Disabled	Poverty 1	Poverty 2	Poverty 3
Total	44,089	11,635,598	3,447,436	1,614,292	926,144	570,586	577,124

Percentages							
Total	*0.2%*	*51.8%*	*15.3%*	*7.2%*	*12.6%*	*7.8%*	*7.8%*

2025 Plan
Meet Highway Noise Criteria

	Other Non-Hispanic	Hispanic	Over 65	Disabled	Poverty 1	Poverty 2	Poverty 3
LA	15,782	3,970,550	1,044,554	459,821	290,355	170,866	173,761
Orange	2,231	827,727	333,727	127,417	44,958	33,138	37,869
Riverside	3,461	844,363	255,746	160,350	79,407	54,551	53,816
San Bernadino	4,652	1,010,769	237,530	160,360	87,149	54,882	54,426
Riverside	485	207,036	91,589	37,792	13,411	9,686	10,776
Total	26,611	6,860,445	1,963,146	945,740	515,280	323,123	330,648

Percentages							
LA	0.2%	58.7%	15.5%	6.8%	13.2%	7.8%	7.9%
Orange	0.1%	37.9%	15.3%	5.8%	6.5%	4.8%	5.5%
Riverside	0.2%	44.5%	13.5%	8.5%	12.7%	8.7%	8.6%
San Bernadino	0.2%	49.5%	11.6%	7.9%	13.5%	8.5%	8.4%
Riverside	0.1%	41.8%	18.5%	7.6%	8.2%	5.9%	6.6%
Total	*0.2%*	*51.3%*	*14.7%*	*7.1%*	*11.9%*	*7.5%*	*7.7%*

Highway Noise Impacts

NOTE: Regional totals do not exactly match those shown in RTP due to omission of some unincorporated areas for technical reasons.

SCAG Region 2025	Income 1 Total	Income 2 Total	Income 3 Total	Income 4 Total	Income 5 Total
Total	1,488,920	1,476,216	1,469,096	1,465,619	1,460,997

Percentages					
Total	*20.2%*	*20.1%*	*20.0%*	*19.9%*	*19.8%*

2025 Plan

Meet Highway Noise Criteria	Income 1 Total	Income 2 Total	Income 3 Total	Income 4 Total	Income 5 Total
LA	457,940	443,745	435,873	427,197	429,862
Orange	77,962	109,320	135,574	167,088	201,561
Riverside	133,993	136,077	134,367	130,591	90,649
San Bernadino	141,456	137,792	142,389	133,009	89,998
Riverside	22,969	28,435	32,011	39,430	40,373
Total	834,320	855,369	880,214	897,315	852,443

Percentages					
LA	20.9%	20.2%	19.9%	19.5%	19.6%
Orange	11.3%	15.8%	19.6%	24.2%	29.1%
Riverside	21.4%	21.7%	21.5%	20.9%	14.5%
San Bernadino	21.9%	21.4%	22.1%	20.6%	14.0%
Riverside	14.1%	17.4%	19.6%	24.2%	24.7%
Total	**19.3%**	**19.8%**	**20.4%**	**20.8%**	**19.7%**

Airport noise -- RTP (2025)

Demographic Group	SCAG Region	Within Noise Areas
Total Persons	22,460,126	71,396
White	28.6%	11.2%
Non-white	71.4%	88.8%
African-American	6.0%	24.7%
Asian/Pac. Isl.	13.1%	5.0%
Latino	51.8%	58.6%
Over 65	15.3%	11.4%
Disabled	7.2%	6.8%
Below Poverty	12.6%	16.3%
1 to 1.5 x Poverty	7.8%	9.0%
1.5 to 2 x Poverty	7.8%	9.1%
Income Q1 (lowest)	20.2%	25.1%
Income Q2	20.1%	23.0%
Income Q3	20.0%	21.8%
Income Q4	19.9%	17.3%
Income Q5	19.8%	12.8%

Highway Noise

Demographic Group	SCAG Region	Within Noise Areas
White	28.6%	29.6%
Non-white	71.4%	70.4%
African-American	6.0%	5.6%
Asian/Pac. Isl.	13.1%	13.0%
Latino	51.8%	51.3%
Disabled	7.2%	7.1%
Over 65	15.3%	14.7%

Demographic Group	SCAG Region	Within Noise Areas
Below Poverty	12.6%	11.9%
1 to 1.5 x Poverty	7.8%	7.5%
1.5 to 2 x Poverty	7.8%	7.7%
Income Q1 (lowest)	20.2%	19.3%
Income Q2	20.1%	19.8%
Income Q3	20.0%	20.4%
Income Q4	19.9%	20.8%
Income Q5	19.8%	19.7%